

# MODULE 3

## UNDERSTANDING MALNUTRITION

Part 1: Fact sheet

Part 2: Technical notes

Part 3: Trainer's guide

Part 4: Training resource list

**Harmonised Training Package (HTP):**  
Resource Material for Training on  
Nutrition in Emergencies. Version 2, 2011



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### Module 3: Understanding malnutrition

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## The Harmonised Training Package (HTP): Resource Material for Training on Nutrition in Emergencies

### What is the HTP?

The Harmonised Training Package: Resource Material for Training on Nutrition in Emergencies (the HTP) is a comprehensive documentation of the latest technical aspects of Nutrition in Emergencies (NiE). The word **Harmonised** reflects the pulling together of the latest technical policy and guidance, the word **Training** refers to its main application and the word **Package** refers to the bringing together of the subject matter into one place. It is organised as a set of modules by subject, each containing technical information, training exercises and a resource list for use in training course development.

The HTP is an initiative of the IASC Global Nutrition Cluster (GNC) and has been endorsed by the GNC and its member's agencies. In 2007, the IASC GNC commissioned the UK based partnership, NutritionWorks, to develop a training resource to facilitate capacity development in the NiE sector. HTP Version 1 was launched in 2008. HTP Version 2 update in 2010/11 was funded under an USAID OFDA grant to the UK based charity, the Emergency Nutrition Network (ENN). The update was undertaken in an ENN/NutritionWorks collaboration, with NutritionWorks responsible for overall coordination and editorial management, and editorial oversight and module production supported by the ENN.

### What the HTP is not

The HTP is not a ready-to-use training course. It cannot be used as an 'off the shelf' package; rather, it should be used as a resource package during a process of course development by experienced trainers.

### Who is the HTP for?

The HTP is a primarily a **resource for trainers** in the NiE sector and it can be used by individuals to increase their technical knowledge of the sector. It is designed to provide trainers from any implementing agency or academic institution with information from which to design and implement a training course according to the specific needs of the target audience, the length of time available for training and according to the training objectives. It is written in clear English and will be available in other languages in the future.

### How is the HTP organised?

The HTP is organized into four sections containing a total of 21 modules which can be used as stand-alone modules or as combined modules depending on the training needs.

#### Section 1: Introduction and concepts

1. Introduction to nutrition in emergencies
2. The humanitarian system: Roles, responsibilities and coordination
3. Understanding malnutrition
4. Micronutrient malnutrition
5. Causes of malnutrition

#### Section 2: Nutrition needs assessment and analysis

6. Measuring malnutrition: Individual assessment
7. Measuring malnutrition: Population assessment
8. Health assessment and the link with nutrition
9. Food security assessment and the link with nutrition
10. Nutrition information and surveillance systems

### **Section 3: Interventions to prevent and treat malnutrition**

11. General food distribution
12. Management of moderate acute malnutrition
13. Management of severe acute malnutrition
14. Micronutrient interventions
15. Health interventions
16. Livelihoods interventions
17. Infant and young child feeding
18. HIV/AIDS and nutrition
19. Working with communities in emergencies

### **Section 4: Monitoring, evaluation and accountability**

20. Monitoring and evaluation
21. Standards and accountability in humanitarian response

Each module contains 4 parts which have a specific purpose as follows:

**Part 1:** The Fact Sheet – provides an overview of the module’s topic and is designed for non-technical people to obtain a quick overview of the subject area.

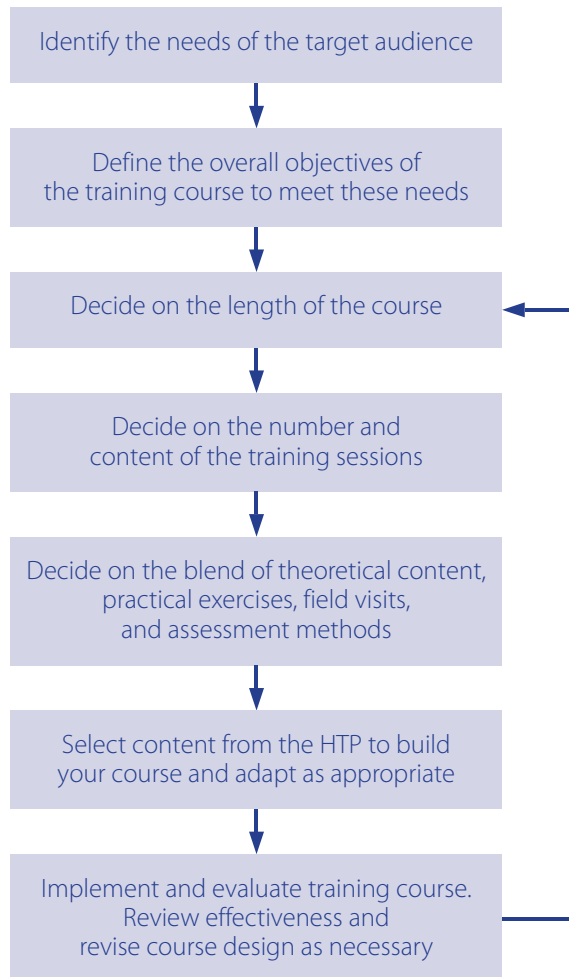
**Part 2:** The Technical Notes – for trainers and trainees, provides detailed technical guidance on current policies and practice.

**Part 3:** The Trainers’ Guide – aims to help trainers develop a training course and provides tips and tools which can be adapted to the specific training context.

**Part 4:** Resources – lists of relevant available resources (including training materials) for the specific technical area.

## How to use the HTP

The HTP should be used during a process of course development. The process of course development involves a number of steps and these are summarised in the diagram below.





## PART 1: FACT SHEET

The fact sheet is the first of four parts contained in this module. It describes different types of *malnutrition*, as well as policy developments in the nutrition sector and the changing global context. Detailed technical information is covered in Part 2. For details of classification of *undernutrition* according to anthropometric criteria see Module 6. Words in italics are defined in the glossary.

### What is malnutrition?

This module is about malnutrition, taken here to mean both **undernutrition** and *overnutrition*; however the latter will be covered in less detail, as it is less of an issue in emergency contexts. Undernutrition reduces Gross Domestic Product (GDP) by at least 3-6% per annum. Poor nutrition is a constraint to recovery and development in the medium- to long-term and perpetuates poverty. Undernutrition can result in *acute malnutrition* or *wasting*, *chronic malnutrition* or *stunting* and micronutrient deficiencies. The focus of this module will be on acute malnutrition, because it is the most immediate outcome in emergencies. Chronic malnutrition, *underweight* and *micronutrient malnutrition* are also covered.

**Acute malnutrition** or *wasting* and/or *oedema* occurs when an individual suffers from current, severe nutritional restrictions, a recent bout of illness, inappropriate childcare practices or a combination of these factors. It is characterised by extreme weight loss, resulting in low weight for height, and/or bilateral oedema and, in its severe form, can lead to death. Acute malnutrition reduces resistance to disease and impairs a whole range of bodily functions. It tends to be highest in children from 12 to 36 months of age. **Around 55 million children suffer from acute malnutrition, of which 19 million are affected by severe acute malnutrition (SAM).**

The nutritional requirements of individuals at different stages of life vary and depend on age, sex, health and physical status, including pregnancy and breastfeeding, environmental conditions such as temperature, and level of physical activity.

**Chronic malnutrition** or **Stunting** reflects the negative effects of nutritional deprivation on a child's potential growth over time. Stunting can occur when a child suffers from long-term nutrient deficiencies and/or chronic illness, so that not only weight but height is affected. It can also be an outcome of repeated episodes of acute infections, or acute malnutrition. Stunting is classified by low height-for-age, indicating a restriction of potential linear growth in children. Because it negatively and often irreversibly affects organ growth, stunting is strongly linked to cognitive impairment.

Chronic malnutrition is not only a long-term development concern, as in emergencies the most vulnerable are often also the poorest, and in many emergency contexts vulnerable children will already be chronically malnourished before they become acutely malnourished. This is especially the case in protracted and slow onset or recurring emergencies such as droughts, or conflict. **195 million children (1 in 3) under five years of age are stunted globally.**

**Underweight** is the effect of both wasting and stunting and is therefore a composite indicator, reflecting either past or present undernutrition. The index does not indicate whether the child has a low weight-for-age because of inadequate weight or because of small stature for his or her age, and therefore cannot distinguish between chronic and acute malnutrition. Often underweight is typified by less visible micronutrient deficiencies, e.g. iron deficiency anaemia. It is used as a measure of the Millennium Development Goals (MDGs). **An estimated 129 million children are underweight – nearly one in four, and 10% of children in the developing world are severely underweight.**

**Overnutrition** results in overweight and obesity, which are descriptions of a person's body mass index (weight/height) and indicate that they carry too much weight for their height. Being overweight or obese increases the risk of chronic diseases such as coronary heart disease, diabetes, and hypertension. Overweight people are not necessarily well-nourished, and may suffer from micronutrient deficiencies due to poorly balanced dietary intake.

## FACT SHEET

For a number of developing countries, high rates of undernutrition can be accompanied by an increasing prevalence of overweight or obesity and associated non-communicable diseases (cardiovascular disease, diabetes and hypertension) resulting in a *'double burden'* of malnutrition.

**Disease and malnutrition are interlinked.** Undernutrition is the result of inadequate dietary intake, disease or both, and in turn, makes individuals more susceptible to disease.

### Who is most vulnerable to malnutrition?

In emergencies population groups can be particularly vulnerable due to their:

- Physiological vulnerability (see below)
- Geographical vulnerability, which reflects their harsh or difficult living environment which may be exacerbated by distance, e.g. desert or mountain communities living in extremes of temperature.
- Political and economic vulnerability, which reflects the community status, lack of representation or isolation
- Being Internally Displaced People (IDPs) or refugees, temporarily or permanently unable to access services or support, increasing their vulnerability
- Previous vulnerability due to food insecurity, poverty, gender, race, religion, land rights etc.

In terms of physiological vulnerability, the most vulnerable are those with increased nutrient needs and those with reduced appetite. They include:

- Low birth weight babies (born <2500 grams or 5lb 8oz)
- 0-59 month-old children, with 0-24 months being particularly vulnerable
- Pregnant and lactating women
- Older people and people living with disability
- Adolescents
- People with chronic illness e.g. people living with HIV and AIDS or tuberculosis

There is an **inter-generational component of malnutrition**, which means that poor growth can be transmitted from one generation to the next. This is known as the cycle of malnutrition.

The **changing nutrition context** over the last 3 years has improved awareness of maternal undernutrition, micronutrient deficiency and the relationship between acute and chronic malnutrition in emergencies. There has been a renewed effort to address undernutrition through more integrated programming, guided by stronger research, policy and advocacy.



**Key messages**

1. Malnutrition encompasses both overnutrition and undernutrition. The latter is the main focus in emergencies and includes both acute and chronic malnutrition as well as micronutrient deficiencies.
2. Underweight, which is a composite indicator of acute and chronic malnutrition, is used to measure progress towards the target 1c of MDG1, "Halve, between 1990 and 2015, the proportion of people who suffer from hunger".
3. Undernutrition is caused by an inadequate diet and/or disease.
4. Undernutrition is closely associated with disease and death
5. Chronic malnutrition is the most common form of malnutrition and causes 'stunting' (short individuals). It is an irreversible condition after 2 years of age.
6. Acute malnutrition, or 'wasting' and/or oedema, is less common than chronic malnutrition but carries a higher risk of mortality. It can be reversed with appropriate management and is of particular concern during emergencies because it can quickly lead to death.
7. There are two clinical forms of acute malnutrition: marasmus, which may be moderate or severe; and kwashiorkor which is characterised by bilateral pitting oedema and is indicative of SAM. Marasmic-kwashiorkor is a condition which combines both manifestations. SAM is associated with higher mortality rates than moderate acute malnutrition (MAM).
8. Low birth weight babies, young children 0-59 months, adolescents, pregnant and breastfeeding mothers, older people, people with chronic illness and people living with disability are most vulnerable to undernutrition.
9. In general, children are more vulnerable than adults to undernutrition due to their exceptional needs during active growth, and their immature immune and digestive systems (infants 0-6 months).
10. The burden of undernutrition (total numbers of combined acute and chronic levels) is greatest in South Asia, whereas the highest rates of acute malnutrition are found in Africa
11. Global nutrition learning, research, policy and guidelines are constantly changing and it is important to stay updated.



# PART 2: TECHNICAL NOTES

The technical notes are the second of four parts contained in this module. They describe different types of *malnutrition*, as well as policy developments in the nutrition sector and the changing global context. The technical notes are intended for people involved in nutrition programme planning and implementation. They provide technical details, highlight challenging areas and provide clear guidance on accepted current practices. Words in italics are defined in the glossary.

#### Summary

This module is about malnutrition, taken here to mean both *undernutrition* and *overnutrition*; however the latter will be covered in less detail, as it is less of an issue in emergency contexts. Undernutrition can result in *acute malnutrition* (i.e. wasting and/or nutritional oedema), *chronic malnutrition* (i.e. stunting), *micronutrient malnutrition* and *inter-uterine growth restriction* (i.e. poor nutrition in the womb). The focus will be on acute malnutrition<sup>1</sup> and to a lesser degree micronutrient deficiencies (covered in more detail in module 4) because they manifest the most rapidly and are therefore more visible in emergencies. Chronic malnutrition and underweight are also covered as they reflect underlying nutritional vulnerability, in many emergency contexts, and are therefore important to understand. Emergency-prone populations are more likely to be chronically malnourished and repeated emergencies contribute to chronic malnutrition over the long term. Thus, effective emergency response is also important for the overall prevention of undernutrition. Certain groups may be more vulnerable to malnutrition and this is covered briefly. Finally the nutrition sector is rapidly evolving, and a number of key developments are outlined towards the end of this module.

Underweight, as a composite measure of acute and chronic malnutrition, is important in emergency contexts, for understanding all forms of undernutrition, and is used as a measure of the Millennium Development Goals (MDGs).

More detail on micronutrients, causes of malnutrition, and measuring malnutrition can be found in modules 4, 5, 6 and 7 respectively. Treatment of malnutrition is addressed in modules 11-18.

These technical notes are based on the following references:

- United Nations System Standing Committee on Nutrition (UNSCN) (2010). Progress in nutrition – 6th report on the World Nutrition Situation. Geneva.
- The Lancet (2008). Maternal and Child Undernutrition 1: global and regional exposures and health consequences. Maternal and Child Undernutrition Series.
- The Sphere Project (2011). Sphere Handbook. 'Chapter 3: Minimum Standards in Food Security and Nutrition.' Geneva.
- Black et al, (2008). Maternal and child undernutrition: global and regional exposures and health consequences. The Lancet Maternal and Child Undernutrition Series.
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- Horton, S., Shekar, M., McDonald, C., Mahal, A., Krystene Brooks, J. (2009). Scaling Up Nutrition: What will it cost? Washington DC. The World Bank.
- Department for International Development (2010). The neglected crisis of undernutrition: DFID's Strategy.
- ACF International (2010). Taking Action, Nutrition for Survival, Growth and Development, White paper.
- WHO/UNICEF (2009). WHO child growth standards and the identification of severe acute malnutrition in infants and children. A Joint Statement by the World Health Organization and the United Nations Children's Fund.

<sup>1</sup> Acute malnutrition will often include some forms of micronutrient deficiencies and occurs over a shorter time frame than chronic malnutrition

**Key messages**

1. Malnutrition encompasses both overnutrition and undernutrition. The latter is the main focus in emergencies and includes both acute and chronic malnutrition as well as micronutrient deficiencies.
2. Underweight, which is a composite indicator of acute and chronic malnutrition, is used to measure progress towards the target 1c of MDG1, "Halve, between 1990 and 2015, the proportion of people who suffer from hunger"
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8. Low birth weight (LBW) babies, young children 0-59 months, adolescents, pregnant and breastfeeding mothers, older people, people with chronic illness and people living with disability are most vulnerable to undernutrition.
9. In general, children are more vulnerable than adults to undernutrition due to their exceptional needs during active growth, and their immature immune and digestive systems (infants 0-6 months).
10. The burden of undernutrition (total numbers of combined acute and chronic levels) is greatest in South Asia, whereas the highest rates of acute malnutrition are found in Africa
11. Global nutrition learning, research, policy and guidelines are constantly changing and it is important to stay updated.

- UNICEF (2009) Tracking progress on Child and Maternal Nutrition
- Save the children, UK (2009). Hungry for Change, An eight step, costed plan of action to tackle global child hunger.

**Introduction**

'Child hunger and undernutrition are persistent problems worldwide: one child in three in developing countries is stunted and undernutrition accounts for 35% of annual deaths for under 5 year olds. Children who survive are more vulnerable to infection, don't reach their full height potential and experience impaired cognitive development. This means they do less well in school, earn less as adults and contribute less to the economy. Without intervention undernutrition can continue throughout the life cycle. There is a crucial window of time during which undernutrition can be prevented – the 33 months from conception to a child's second birthday. If action is not taken during this period the effects of undernutrition are permanent.'<sup>2</sup>

Children suffering from acute malnutrition have generally been the focus of nutritional concern during emergencies. This is because severe wasting can quickly lead to death, especially among children under 5 years old who are most vulnerable to disease and malnutrition. In recent years, however, maternal undernutrition, micronutrient deficiency and chronic malnutrition have received more focus. Repeated or protracted emergencies contribute to a rise in chronic malnutrition over the long term, as well as increasing the likelihood of micronutrient deficiencies and maternal malnutrition. It is therefore important to be aware of all types of undernutrition. Emergencies that result in high acute malnutrition rates tend to be in the poorest countries that already have raised rates of chronic malnutrition.

Undernutrition reduces gross domestic product (GDP) by an estimated 3-6% and costs billions of dollars in lost productivity and healthcare spending. Save the Children's, Hungry for Change paper, states that, 'Malnutrition reduces the impact of investments in key basic services: it holds back progress in education, in mortality reduction and in treatment of HIV and AIDS.'<sup>3</sup> Effective response to nutrition emergencies is essential

<sup>2</sup> Save the children, UK (2009). Hungry for Change, An eight step, costed plan of action to tackle global child hunger.

<sup>3</sup> Save the children, UK (2009). Hungry for Change, An eight step, costed plan of action to tackle global child hunger.

### Double burden of malnutrition

Evolving dietary practices can result in a shift away from traditional diets towards more 'globalised foods'. These can include: increased intakes of processed foods, animal products, sugar, fats and sometimes alcohol. These foods are sometimes described as foods of minimal nutritional value. Such diets may be inadequate in micronutrients but contain high levels of sodium, sugar and saturated or trans fats, excessive amounts of which are associated with increased risk of non-communicable diseases. For a number of developing countries, high rates of undernutrition can be accompanied by an increasing prevalence of overweight or obesity and associated non-communicable diseases (cardiovascular disease, diabetes and hypertension) resulting in a 'double burden' of malnutrition.

There is evidence that this burden is shifting towards low-income groups, especially when combined with trends such as urbanisation. At the household level, women working outside of the home, exposure to mass media and increasingly sedentary working patterns encourage the consumption of convenience foods. These are fast to prepare and consumed at home or as street foods. This can easily lead to the presence of both undernutrition and overnutrition within the same household. Causal analysis of malnutrition is even more important in such contexts, in order to identify who is affected by undernutrition and overnutrition due to consumption of unhealthy diets.<sup>4</sup>

Recent emergencies in Gaza, Iraq, India, Philippines, Kazakhstan, Lebanon and Algeria, have highlighted cases of malnutrition in infants and children due to low *exclusive breastfeeding* rates and poor infant feeding practices (amongst other causes), where the mother, father or elders within the household are overweight or obese.<sup>5</sup>

to tackling this burden of undernutrition. It should, however, be part of a broader strategy that aims to prevent and manage all forms of undernutrition in both emergency and non-emergency contexts.

### What is Malnutrition?

Malnutrition includes both undernutrition – acute malnutrition (i.e. wasting and/or nutritional oedema), chronic malnutrition (i.e. stunting), micronutrient malnutrition and inter-uterine growth restriction (i.e. poor nutrition in the womb) – and **overnutrition** (*overweight and obesity*<sup>6</sup>). Overnutrition will be covered in less detail, as it is less of an issue in emergency contexts. Undernutrition is common in low-income groups in developing countries and is strongly associated with poverty. However, in many developing countries, under- and overnutrition occur simultaneously. This phenomenon is referred to as the *double burden of malnutrition*.

### Acute malnutrition

Acute malnutrition or wasting (and/or oedema) occurs when an individual suffers from current, severe nutritional restrictions, a recent bout of illness, inappropriate childcare practices or, more often, a combination of these factors. It is characterised by extreme weight loss, resulting in low weight for height, and /or bilateral oedema<sup>7</sup>, and, in its severe form, can lead to death.<sup>8</sup> Acute malnutrition reduces resistance to disease and

impairs a whole range of bodily functions. Acute malnutrition may affect infants, children and adults. It is more commonly a problem in children under-five and pregnant women, but nonetheless this varies and must be properly assessed in each context. Levels of acute malnutrition tend to be highest in children from 12 to 36 months of age when changes occur in the child's life such as rapid weaning due to the expected birth of a younger sibling or a shift from active breastfeeding to eating from a family plate, which may increase vulnerability.

The most visible consequences of acute malnutrition are weight loss (resulting in moderate or severe wasting) and/or nutritional oedema (i.e. bilateral swelling of the lower limbs, upper limbs and, in more advanced cases, the face). Acute malnutrition is divided into two main categories of public health significance: **severe acute malnutrition** (SAM) and **moderate acute malnutrition** (MAM). MAM is characterised by moderate wasting. SAM is characterised by severe wasting and/or nutritional oedema.

The term *global acute malnutrition* (GAM) includes both SAM and MAM. Mild acute malnutrition also has consequences but is not widely used for assessment or programming purposes.

Acute malnutrition increases an individual's risk of dying because it compromises immunity and impairs a whole range of bodily functions. When food intake or utilisation (e.g. due to illness) is reduced, the body adapts by breaking down fat

<sup>4</sup> United Nations Standing Committee on Nutrition (UNSCN) (2010). Progress in Nutrition – 6th report on the world nutrition situation.

<sup>5</sup> FAO (2006). The double burden of malnutrition. Case studies from six developing countries. Food and Nutrition Paper 84, FAO.

<sup>6</sup> Defined as: Overweight among non-pregnant women aged 15 to 49 years (26-30) and Obesity among non-pregnant women aged 15 to 49 years (>30 BMI)

<sup>7</sup> Kwashiorkor described later in the text

<sup>8</sup> ACF International (2010) Taking Action, Nutrition for Survival, Growth and Development, White paper.

## TECHNICAL NOTES

and muscle reserves to maintain essential functions, leading to wasting. The body also adapts by decreasing the activity of organs, cells and tissues, which increases vulnerability to disease and mortality. For reasons not completely understood, in some cases, these changes manifest as nutritional oedema. A vicious cycle of disease and malnutrition is often observed once these adaptations commence.

SAM can be a direct cause of death due to related organ failure. More often, however, acute malnutrition works as a driver of vulnerability, while the actual, final cause of death may be a common illness, such as diarrhoea, respiratory infection or malaria. Despite operating as a less visible 'underlying cause', acute malnutrition is responsible for a shocking 14.6% of the total under-five death burden each year.<sup>9</sup>

Acute malnutrition differs from chronic malnutrition in three important ways which explain why it is traditionally prioritised in emergencies. First, it progresses and becomes visible over a much shorter time period. Hence, the prevalence of GAM among under-fives in a population is often a criterion to declare a nutritional emergency in the first place. Second, the mortality risk associated with acute malnutrition is roughly double that for chronic malnutrition (although chronic malnutrition is more prevalent). Third, wasting and nutritional oedema have a much greater potential to be reversed within a few months of treatment if detected early enough. In contrast, chronic malnutrition is difficult to reverse, particularly in children older than two years. This is because chronic malnutrition reflects past growth failure (i.e. failure to add height) due to the cumulative effects of poor diet and care that may have even begun in the womb (see chronic malnutrition and intra-uterine growth restriction).

Because acute malnutrition presents a more immediate and potentially reversible public health problem, its *management* or *treatment* is generally prioritised in emergencies when case loads are often high. Nonetheless, prevention of chronic malnutrition, micronutrient deficiencies and, indeed, future cases of acute malnutrition are essential complementary strategies, particularly in protracted emergencies. There is a strong link between acute and chronic malnutrition, as a single or repeated bouts of acute malnutrition will contribute to growth failure during the first five years of life.

Roughly 55 million children in the world suffer from acute malnutrition at any one time; this is 10% of all children under 5 years of age. Although more children suffer from chronic malnutrition (178 million, or 32% of children under 5 years), the higher mortality risk associated with acute malnutrition

mean the actual contribution to global death burden is similar.<sup>10</sup>

Measuring acute malnutrition is addressed in Modules 6 and 7 and the treatment of acute malnutrition is discussed in Modules 12 and 13.

### Moderate Acute Malnutrition (MAM)

The burden of MAM (wasting) globally is considerable. Moderate wasting affects 11% of the world's children, with a risk of death 3 times greater than that of well-nourished children. Around 41 million children are moderately wasted worldwide and the management of MAM is finally becoming a public health priority, given this increase in mortality and the context of accelerated action towards achievement of Millennium Development Goals (MDGs) 3 and 4. Children with MAM have a greater risk of dying because of their increased vulnerability to infections as well as the risk of developing SAM, which is immediately life threatening.<sup>11</sup>

Some children with MAM will recover spontaneously without any specific external intervention; however the proportion that will spontaneously recover and underlying reasons are not well documented.

### Severe Acute Malnutrition (SAM)

There are an estimated 19 million children with SAM in low and middle-income countries. A child suffering from SAM is 9.4 times more likely to die than a well-nourished child. This means that SAM accounts for at least 4% of the global under-five deaths each year.<sup>12</sup>

Acute malnutrition is distinguished by its clinical characteristics of wasting and/or bilateral pitting oedema<sup>13</sup>

- **Marasmus** – severe wasting presenting as both moderate and severe acute malnutrition
- **Kwashiorkor** – bloated appearance due to water accumulation (nutritional bilateral pitting oedema)
- **Marasmic kwashiorkor** – is a condition which combines both manifestations.

**Marasmus**<sup>14</sup> is characterized by severe wasting of fat and muscle, which the body breaks down to make energy leaving 'skin and bones'. A child with marasmus is extremely thin with a wizened 'old man' appearance. This is the most common form of acute malnutrition in nutritional emergencies.

<sup>9</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on maternal and child undernutrition.

<sup>10</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

<sup>11</sup> HTP Module 12, Management of Acute Moderate Malnutrition

<sup>12</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition

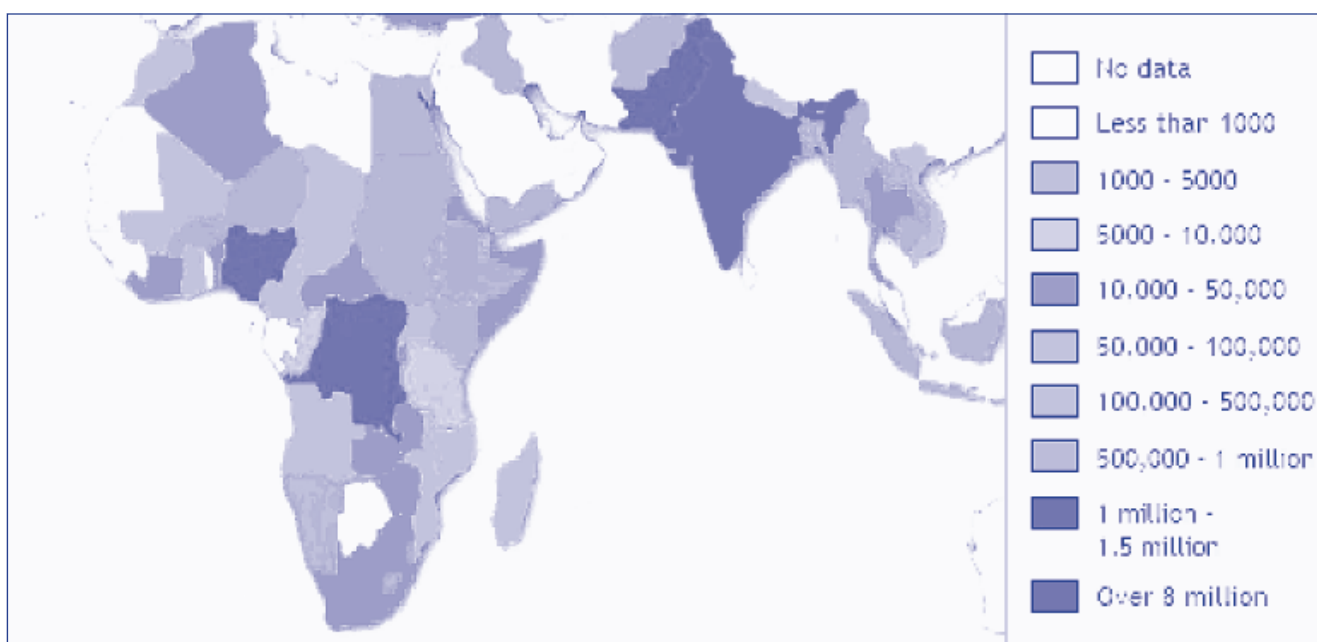
<sup>13</sup> This is based on the 1970 Wellcome Classification.

<sup>14</sup> weight-for-height <70% of the median, or below -3 Z scores, and/or made up arm circumference (MUAC) <115mm in children 6-59 months.

Kwashiorkor is characterised by bilateral pitting oedema<sup>15</sup> (affecting both sides of the body). The child may not appear to be malnourished because the body swells with the fluid, and their weight may be within normal limits. In its severe form, Kwashiorkor results in extremely tight, shiny skin, skin lesions and discoloured hair<sup>16</sup>.

The map below shows SAM prevalence in children under-5 years, by country in the two most affected regions – Africa and Asia. Countries with the highest SAM prevalence include Democratic republic of Congo (DRC), Burkino Faso, Sudan, India, Cambodia and Djibouti<sup>17</sup>. In India alone there are an estimated 8 million severely wasted children.

Figure 1: Prevalence (n) of SAM in South-central Asia and sub-Saharan Africa



Source: ACF International (2010). *Taking Action, Nutrition for Survival, Growth and Development, White paper.*

Case example 1 highlights an example of where rates of acute malnutrition have risen gradually over 9 years, and then more sharply following floods in 2010. Rates of SAM are high as a proportion of the total GAM. Chronic malnutrition has also risen, demonstrating that the same factors cause chronic and acute malnutrition, in this context, over a different time frame.

### Chronic malnutrition

Chronic malnutrition or stunting results from the same underlying causes as acute malnutrition but occurs more gradually over a longer-term. Chronic malnutrition is most critical during childhood when it inhibits growth and essential cognitive development. The result is childhood stunting, where the child is too short for his/her age. Unfortunately, childhood stunting is irreversible after two years of age, and stunted children grow up to be stunted adults with reduced physical and cognitive capacity. As a result, stunting is associated with poverty, poor health, impaired educational attainment, reduced work productivity and lower wage earning potential throughout one's

life. Chronic malnutrition is often referred to as 'silent malnutrition' or 'invisible malnutrition' largely because stunted children are short but proportional and because it is so prevalent in some regions it is accepted as 'normal'.

The most effective strategy for tackling chronic malnutrition is to prevent it and critically this must be done within the first 33 months, from conception (-9 months) to 2 years of age (+24 months). Although it is difficult to 'treat' chronic malnutrition, actions taken in emergencies are critical to preventing shocks to child growth, which eventually result in chronic malnutrition. This includes providing access to quality foods, micronutrient supplements, timely and effective treatment of acute malnutrition, safe water and good quality health care. In protracted emergencies, chronic malnutrition can increase without any significant increase in the level of acute malnutrition. In such contexts, chronic malnutrition may be as important a nutritional indicator as acute malnutrition; even if it is slower to change at the population level. It should, therefore, not be discounted in humanitarian responses (see case example 2).

<sup>15</sup> Oedema is present when the leg is pressed with the thumb just above the ankle, and a definite pit remains after three seconds on both sides of the body.

<sup>16</sup> ACF International (2010) *Taking Action, Nutrition for Survival, Growth and Development, White paper.*

<sup>17</sup> ACF International (2010) *Taking Action, Nutrition for Survival, Growth and Development, White paper.*

## Case example 1: Acute malnutrition in Pakistan 2010

Following the devastating floods in July/August, a nutrition survey was carried out in October 2010 in the flood-affected provinces of Pakistan. The highest rates of malnutrition were found in northern Sindh. Very little nutritional data exists in Pakistan. The last national nutrition survey, in 2001-2 found a GAM of 13.1%, SAM of 3.1% and a chronic malnutrition rate of 36.8%. There is no Sindh-wide data but a survey in one district of Sindh in 2007 showed 16.7% GAM and 2.2% SAM.

**In Oct 2010, Acute malnutrition:** rates of wasting among under-five-year-olds were found to be 22.9% GAM and 6.1% SAM. The highest rates of MAM were found in the 6-17 month age group, and the highest rates of SAM were in the 18-29 month age group. Women were also found to be moderately malnourished (11.2% Mid-upper arm circumference (MUAC)  $\geq$ 185 mm <210 mm) and severely malnourished (1.9% MUAC <185 mm).

Acute malnutrition was significantly associated with high prevalence of illnesses, mainly *diarrhoea*, *malaria* and *acute respiratory infections* and poor *infant and young child feeding* (IYCF) practices, as well as poor sanitation and use of unsafe drinking water. Vitamin A deficiency was identified through clinical symptoms and yet measles vaccination coverage and Vitamin A supplementation was very low (<30% coverage). No mortality data was available, as the government had not agreed to its collection. Six months post-floods the economic access to food is poor, and household food security is not predicted to return to pre-flood levels until April 2012.

**In Oct 2010, Chronic malnutrition:** rates of stunting were 54% (up from 36.8% in 2001) reflecting the poor sanitation, use of unsafe drinking water, high rates of diarrhoea, poor infant feeding and breast feeding practices, low purchasing power and chronic food insecurity. Basic causes included low age of marriage, high parity, high rates of low birth weight (21%), poor governance, low rates of female education, high household debts, and a landlord system that functioned like bonded labour.

This demonstrates the importance of understanding the historical and contextual picture of malnutrition and poverty in order to understand the inter-relationship between chronic and acute malnutrition. **Chronic and acute malnutrition are not mutually exclusive but often overlapping and are particularly crucial in the vulnerable under-2 year-olds.** The immediate and underlying causes are often the same, but are more acute in the period of recovery after a shock such as the floods. In this case, the household food insecurity, inadequate care practices, unhealthy environment and poor service provision all contributed to rising levels of both acute and chronic malnutrition, and care practices were considered to be the most significant factor in the cause of malnutrition for the children less than two years old.

Source: Nutrition Causal Analysis, Pakistan, March 2011, Laura Phelps, Oxfam GB

Stunting affects approximately 178 million children<sup>18</sup> under 5 years old in the developing world, or about one in three. Africa and Asia have high stunting rates of 40% and 36% respectively, and more than 90% of the world's stunted children live on these two continents. Of the 10 countries that contribute most to the global burden of stunting in terms of absolute number of stunted children, 6 are in Asia. The countries with the highest prevalence of stunting (50% and over) include: Bangladesh, Angola, India, Zambia, Afghanistan, Niger, Malawi, Madagascar, Nepal, Ethiopia, Yemen, Guatemala and Burundi. Due to the high prevalence of stunting (48%) in combination with a large population, India alone has an estimated 61 million stunted children.<sup>19</sup>

**Case example 2** demonstrates the risk of chronic malnutrition and micronutrient deficiencies developing in protracted emergencies.

## Underweight

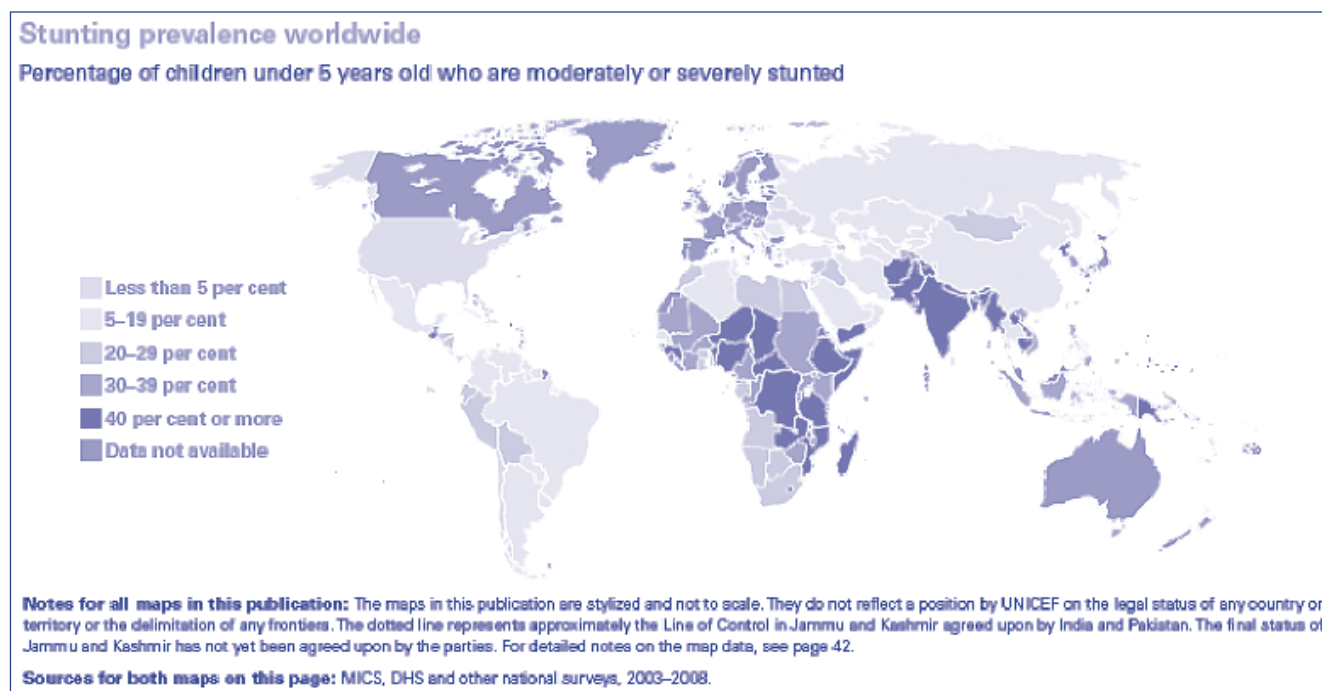
Underweight is a general measure that captures the presence of wasting and/or stunting. It is therefore a composite indicator, reflecting either acute or chronic undernutrition without distinguishing between the two. The index does not indicate whether the child is 'underweight' due to reduced fat/ muscle mass (wasting) or due to unattained height for his or her age (stunting). As such, its utility as an indicator for assessment or programming is limited because it does not indicate the nature of the problem or the timeframe for the required response. At the population level it does not indicate if an immediate emergency therapeutic response or longer term prevention programme is needed. At the individual level, it does not allow immediate detection and referral of acute malnutrition for appropriate treatment. It is advantageous, however, because it is easier to measure than stunting or wasting, for which an additional height measurement is required. It is also one of the key indicators for MDG 1.

<sup>18</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

<sup>19</sup> UNICEF (2009) Tracking progress on Child and Maternal Nutrition



Figure 2: Stunting prevalence worldwide



Source: MICS, DHS and other national surveys (2003-2008), via UNICEF (2009) Tracking progress on Child and Maternal Nutrition

#### Case example 2: Chronic malnutrition in Occupied Palestinian Territory (OPT): 2008

Since the second intifada in 2000, living conditions for refugee and non-refugee populations in both rural and urban areas of the West Bank and Gaza Strip have deteriorated. Lack of access to land to grow food and to neighbouring Israel for employment in building and agricultural sectors have left many Palestinian families with depleted household assets. In addition, there has been sporadic violence between warring factions. As a result, there are indications that the diet has become more monotonous and there is an increased dependency on food aid.

Acute malnutrition rates amongst children under 5 have remained low, but the rate of **chronic malnutrition** has risen over the last few years, from 8.3% in 2000, to 13.2% in 2006, and reaching 14% in 2008, in Shijaia, Eastern Gaza. However, there is a high rate of low birth weight (7%) and 'alert level' micronutrient deficiency rates (iron deficiency anaemia >40%, vitamin A deficiency >20% in certain age groups, and a rickets prevalence of 4.1% in 6-36 month olds). These have been attributed to poor dietary diversity (due to a reliance on food aid and a lack of purchasing power) and a decline in good infant and breastfeeding practices. Only 2.7% of mothers surveyed practiced exclusive breastfeeding, and only 77.7% met the minimum dietary diversity. Ninety-nine per cent of the mothers who stopped breastfeeding felt that they were unable to produce enough milk as the result of breast problems, stress or fear.

This low level food insecurity, poor dietary diversity, and poor breastfeeding and infant feeding practices are resulting in a steady rise in the rate of chronic malnutrition and micro-nutrient deficiencies. This case demonstrates the importance of analysing the causes and changes in rates of both chronic and acute malnutrition, especially in protracted emergencies such as this.

Source: Thurstan, S., Sibson, V. (2008), Assessing the inter-vention on infant feeding in Gaza. Field Exchange, issue 38, p 23-25 and Abu Hamad, Bassam., Johnson, E. (2008). Experiences and addressing malnutrition and anaemia in Gaza. Field Exchange, issue 38, p 26-29.

An estimated 112 million children under-five are underweight<sup>20</sup> – nearly one in four – and 10% of under-fives in the developing world are severely underweight. The prevalence

of underweight among children is higher in Asia than in Africa, with rates of 27% compared to 21%. This is mainly due to stunting rather than wasting.

<sup>20</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

## TECHNICAL NOTES

Underweight is used to assess progress towards the MDG 1 hunger target. Underweight cases are responsible for up to a 3-6% reduction in GDP at country level.<sup>21</sup>

### Micronutrient deficiencies<sup>22</sup>

Micronutrients are minerals and vitamins that are needed in tiny quantities (and are therefore known as micronutrients). Micronutrient deficiencies account for roughly 11% of the under-five death burden each year.<sup>23</sup> It is now recognised that poor growth in under-fives results not only from a deficiency of protein and energy but also from an inadequate intake of vital minerals (e.g., zinc), vitamins, and essential fatty acids<sup>24</sup>.

Vitamins are either water-soluble (e.g. the B vitamins and vitamin C) or fat-soluble (e.g. vitamins A, D, E and K). Essential minerals include iron, iodine, calcium, zinc, and selenium. There are internationally accepted dietary requirements for many micronutrients. Sphere standards state that people affected by emergencies have a right to a diet that is nutritionally adequate. Therefore, there should be no cases of clinical micronutrient disease. In particular there should be no cases of *scurvy* (vitamin C deficiency), *pellagra* (niacin deficiency), *beriberi* (thiamine deficiency) or *ariboflavinosis* (riboflavin deficiency). The rates of *xerophthalmia* (vitamin A deficiency) and *iodine deficiency disorders* should be below levels of public health significance. Despite the existence of international standards for dietary requirements there have been recent outbreaks of many of these diseases. Micronutrient malnutrition continues to affect populations in emergencies and is a significant cause of morbidity, mortality, and reduced human capital<sup>25</sup>. See below for key micronutrient deficiencies<sup>26</sup>:

- Iron deficiency leads to iron deficiency anaemia
- Vitamin C deficiency leads to scurvy
- Vitamin A deficiency leads to xerophthalmia
- Niacin or Vitamin B3 deficiency leads to pellagra
- Iodine deficiency leads to goitre and cretinism (in infants born to iodine deficient mothers)
- Thiamin or B1 deficiency leads to beriberi
- Riboflavin deficiency leads to ariboflavinosis
- Vitamin D deficiency leads to rickets

The main cause of micronutrient malnutrition is usually an inadequate dietary intake of vitamins and/or minerals. Food

aid rations have often failed to meet Sphere standards for micronutrient adequacy. Intakes lacking dietary diversity are strong predictors of micronutrient deficiency disease (MDD). Equally, infections are an additional and important cause of micronutrient malnutrition, and can negatively affect nutritional status by increasing nutrient requirements and reducing nutrient absorption.

Globally, iron deficiency anemia is the most common micronutrient disorder. Large numbers are also affected by iodine and vitamin A deficiencies. These endemic deficiencies often affect populations in emergencies. In addition, epidemics of MDD such as pellagra, scurvy, beriberi, ariboflavinosis and rickets occur in populations affected by severe poverty or experiencing crisis.

Ensuring that micronutrient deficiency diseases are monitored as part of the health information system is an important part of effective surveillance. Specialist approaches may be required to accurately identify and quantify the extent of a deficiency problem. However, high rates of acute malnutrition often indicate the presence of micronutrient deficiencies within the under-5 child population. Proxy indicators may also be used. For example Vitamin A deficiency initially presents as night blindness, which if untreated may progress to bitots spots and gradually to xerophthalmia. Night blindness can be roughly assessed through interviews and the progressive symptoms through the clinical signs. When such micronutrient-related deficiencies become widespread they can present themselves as epidemics within the population group.

### Intrauterine growth restriction

Weight at birth is a good indicator not only of a mother's health and nutritional status but also of the newborn's chances of survival, growth, long-term health and psychosocial development. Low birth weight (LBW) (less than 2.5 kg) carries a range of grave health risks for children. Babies who were undernourished in the womb face a greatly increased risk of dying during their early months and years. Those who survive have impaired immune function and increased risk of disease; they are likely to remain undernourished, with reduced muscle strength, throughout their lives, and suffer a higher incidence of diabetes and heart disease in later life. Children born underweight also tend to have a lower IQ and reduced cognitive development, affecting their performance in school and their job opportunities as adults.<sup>27</sup>

<sup>21</sup> Save the children, UK (2009). Hungry for Change, An eight step, costed plan of action to tackle global child hunger.

<sup>22</sup> For more information about micronutrients refer to Module 4 and 14.

<sup>23</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

<sup>24</sup> Not a micronutrient

<sup>25</sup> Module 4 Micronutrient Malnutrition

<sup>26</sup> See Module 4 for more detail on each deficiency

<sup>27</sup> UNICEF/WHO (2004). Low Birth weight: Country, regional and global estimates, UNICEF, New York.

### Case example 3: Sub-optimal breastfeeding and infant feeding in Haiti: 2010

Following the massive earthquake that struck Haiti in January 2010, there was an urgent need to understand: a) the types and causes of malnutrition that were present before the earthquake; b) how and among which population groups the earthquake was likely to increase vulnerability; c) the type of response required to immediately address and reduce these vulnerabilities. While this type of analysis is essential when responding to any emergency, it was particularly important during the Haiti crisis due to its overwhelming scale, rapid onset and the unique urban context. At the time of the earthquake, the most recent nutrition assessments available came from the 2005 Demographic Health Survey (DHS) and an ACF survey in 2008/09.

The DHS showed a considerable level of stunting pre-earthquake (24% of under-fives <-2 height-for-age Z-scores), a relatively low level of global wasting (9% were <-2 weight-for-height Z-scores) and a somewhat high level of severe wasting (2% were <-3 weight-for-height z-scores). Stunting and wasting levels were traditionally higher in rural versus urban areas. There was general agreement that the prevalence of acute malnutrition could rapidly escalate given the poor food security and hygiene conditions, and as a result services for the community-based management of acute malnutrition (CMAM) were scaled up.

It was also agreed, however, that one of the greatest risks to nutritional status and child survival was poor infant feeding practices. Before the earthquake, only 40% of children under six months were exclusively breastfed (DHS 2005) this rate was only 22% in Port-au-Prince (Enquêtes nutritionnelle 2007-2009, Action Contre la Faim). Based on this understanding of the situation pre-earthquake and the danger posed by the deterioration in the hygiene environment post-earthquake, infant feeding promotion in the form of 'baby tents' was established across the city, where infant feeding assessment, counselling and where necessary, safe infant formula were provided.

South-central Asia has the highest proportion of LBW at 27% of babies born, compared with a 14.3% rate in Africa<sup>28</sup>. African children's higher birth weight and lower underweight prevalence is partly due to the greater body size of their mothers when pregnant. There is a strong association of low birth weight with low body mass index (BMI) or MUAC in women. This has implications for sustained nutritional improvement in women from childhood, through adolescence and then pre-, during and post pregnancy.

Increased birth weight contributes to a reduction in growth faltering by two years of age, resulting in less stunting, which is eventually reflected in increased adult height. Improved cognitive function and intellectual development is an outcome of this improved nutritional status.

Improving birth weights is not just the responsibility of development actors, as birth weights can be rapidly improved, even in populations with short adult women (with small pelvises), by improving dietary quantity and quality during or preferably before the first trimester of pregnancy.<sup>29</sup>

### Suboptimal breastfeeding

Inadequate breastfeeding is a potentially serious threat to nutritional status in newborns and young infants under the age of six months. Babies should be breastfed immediately (within

1 hour) after birth, exclusively breastfed for the first six months and ideally continue breastfeeding into the second year of life to maximise their survival and development. However, exclusive breastfeeding is rarely practised in more than half of the children less than 6 months of age receiving breast milk. Dilution and displacement of breast milk with other fluids such as water, tea or gruel both reduce the nutritional and immunological support from the breast milk and increase the risk of infection from unclean water, cups or bottles. This can result in malnutrition extremely early in life or directly to death. Barriers to optimal breastfeeding include cultural barriers, women's work burden – especially in urban environments where infants and mothers may be separated due to wage labour circumstances.

Increasing the number of babies who are breastfed optimally could result in a dramatic reduction in child mortality. Evidence of the benefits of breastfeeding has formed the basis for the three breastfeeding goals<sup>30</sup>:

- All babies should be put to the breast immediately after birth (known as early initiation). The first milk (colostrum) provides an unequalled boost to the baby's immune system
- For the first six months baby should only be given breast milk and no other food or liquids (including water) – this practice is called 'exclusive' breastfeeding

<sup>28</sup> UNICEF (2009) Tracking progress on Child and Maternal Nutrition

<sup>29</sup> United Nations System. Standing Committee on Nutrition (UNSCN) (2010). Progress in nutrition – 6th report on the World Nutrition Situation. UNSCN, Geneva.

<sup>30</sup> Indicators for assessing infant and young child feeding practices: conclusions of a consensus meeting held 6-8 November 2007 in Washington D.C., USA.

## TECHNICAL NOTES

- Young children should continue to be breastfed until they are at least two years old

**Case example 3** highlights the relationship between infant and young child feeding (IYCF) and acute malnutrition.

### Food and nutrition security

The concept of nutrition security has emerged to give greater emphasis to considerations of consumption patterns within the household, and include a critical element of caring practices. *'Nutrition security exists when food security is combined with the sanitary environment, adequate health services and proper care and feeding practices to ensure a healthy life for all household members'*.<sup>31</sup> Undernutrition can only be addressed if the three underlying causes – household food insecurity, inadequate care and unhealthy environment/lack of health services – are addressed (see conceptual framework of malnutrition below).

In recent years nutrition interventions have become somewhat compartmentalised due to the specialised nature of anthropometric surveys or therapeutic treatment protocols. This has, in some cases, led to a reduction in integrated programme approaches, as agencies specialising in nutrition are not always able to, or do not feel accountable for addressing all of the elements of food and nutrition security. Improved understanding of the conceptual framework for undernutrition and improved coordination is one step to ensuring nutrition security is assured. In emergencies, the cluster coordination system is one mechanism<sup>32</sup> that is aiming to improve coordination and response analysis for this purpose.

When applying the universally accepted definition of **food security**, *'when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life'*, to programming the main responses are often focused on households, their resilience and access to assets, income and food energy. This approach ignores two elements of the accepted food security definition: *'all people'* i.e. each individual within the household; and *'nutritious food'* i.e. including protein, micronutrients (minerals and vitamins), etc. The result is that huge opportunities for integrated programming are lost.<sup>33</sup>

It is important that food security programming is not only concerned with meeting the cost of the food basket, or providing 2100 kcal; but that it also considers the intra-household distribution of food (which may prioritise men and elders), and

the quality of food to ensure macro- and micronutrient needs are met. It is therefore important to monitor and analyse dietary diversity and food consumption patterns so that this understanding can facilitate appropriate programme, policy and advocacy approaches.

### Conceptual Framework of Malnutrition

Insufficient access to food, poor dietary diversity, poor quality healthcare services, poor environmental sanitation, inadequate care of children, gender inequalities, and low educational levels of caregivers, are among the key causes of malnutrition. Food, health and care must all be available for survival, optimal growth and development<sup>34</sup>. Module 5 looks in more detail at the causes of malnutrition which are outlined in the conceptual framework below<sup>35</sup>:

### Morbidity

Undernutrition is the result of inadequate dietary intake, disease or both. Disease contributes through loss of appetite, malabsorption of nutrients, loss of nutrients through diarrhoea or vomiting. If the body's metabolism is increased due to illness then there is a greater risk of malnutrition. An ill person needs more nutrients to rehabilitate and if they do not meet their needs they become malnourished.

Undernutrition makes people more susceptible to infections and disease in general and slows recovery. There is evidence that the severity of illness is worse among malnourished populations than among healthy populations. Infections can result in a borderline nutritional status turning into a clear case of malnutrition, particularly in young children. Disease patterns are affected by seasonal changes. Increased rainfall and changes in temperature all have an impact on disease. In emergencies, factors such as overcrowding, inadequate sanitation, poor water quality / supply and lack of health care also increase risks of diseases proliferating. The following bullet points describe the impact of malnutrition in infants, children and women:

#### Infants and children:

- Reduces the ability to fight infection
- Impairs the immune system and increases the risk of some infections
- Impairs growth
- Increases the chance of infant and young child mortality

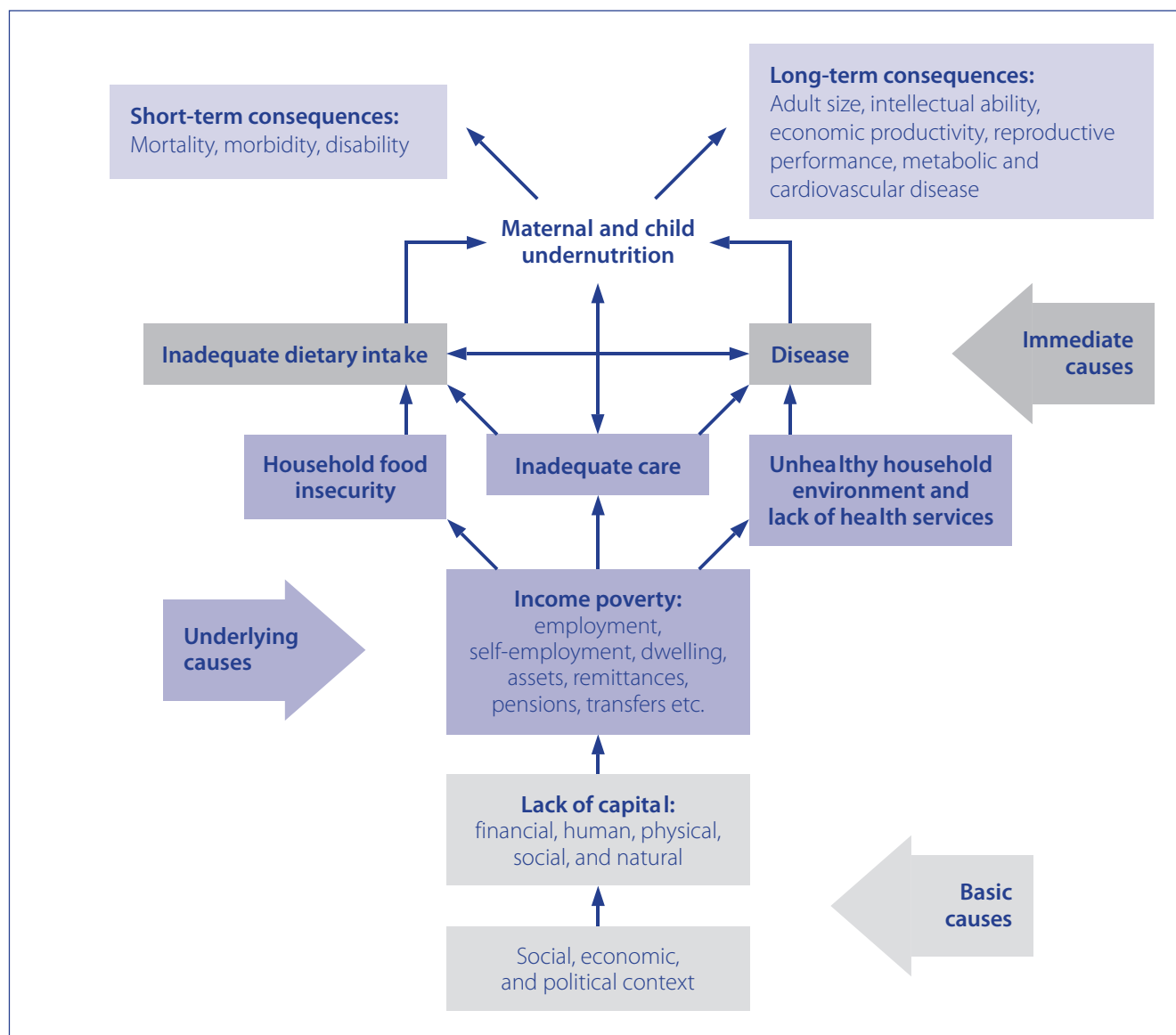
<sup>31</sup> Shakir, M. (2006) Repositioning Nutrition as central to development. Washington DC, World Bank

<sup>32</sup> The Nutrition Cluster, with UNICEF as the lead agency, is one of 12 sectoral clusters, Cluster lead objectives, include providing sectoral leadership, strengthening preparedness and technical capacity and enhancing partnerships.

<sup>33</sup> Chastre, C, Levine, S. (2010). Nutrition and food security response analysis in emergency contexts

<sup>34</sup> ACF International (2010). Taking Action, Nutrition for Survival, Growth and Development, White paper, p 27

<sup>35</sup> Chastre, C, Levine, S. (2010) Nutrition and food security response analysis in emergency contexts

Figure 3: Nutrition conceptual framework (adapted from UNICEF)<sup>36</sup>

- Increases fatigue and apathy
- Impaired cognitive development
- Reduces learning capacity

#### In women:

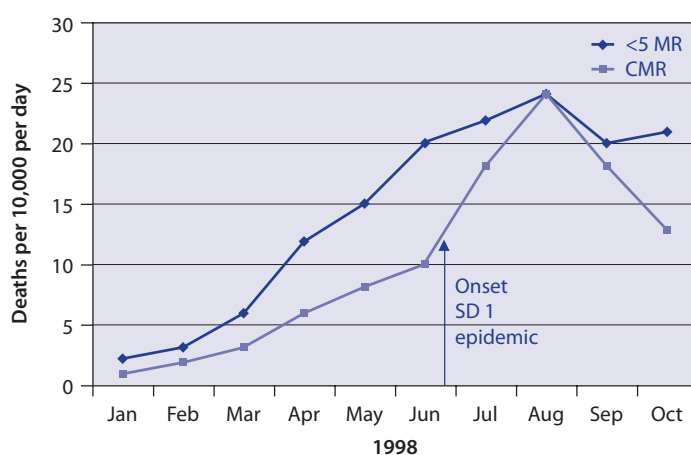
- Increases the risk of complications during pregnancy
- Increases the risk of spontaneous abortions, stillbirths, impaired foetal brain development and infant deaths
- Increases the risk of maternal death from spontaneous abortion, stress of labour and other delivery complications
- Increases the chance of producing a *low birth weight* baby
- Reduces work productivity
- Increases the risk of infection including HIV and reproductive tract infections
- Results in additional sick days and lost productivity

<sup>36</sup> Chastre, C, Levine, S. (2010) Nutrition and food security response analysis in emergency contexts

## Case example 4: Mortality rates in Awok, Southern Sudan: 1998

This graph shows both crude mortality rates (CMR)<sup>37</sup> and under-five mortality rates (U5MR)<sup>38</sup> in Awok over a 10-month period in 1998. First, U5MR rose faster than CMR, probably because children were more vulnerable to malnutrition. However, in July there was an outbreak of dysentery (bloody diarrhoea), and CMR caught up with the U5MR. These are extremely high mortality rates which were coupled with high rates of acute malnutrition. In July a nutritional survey revealed a prevalence of acute malnutrition in children 6 to 59 months of 80 per cent (<-2 z-score, weight for height). By October this was still 48 per cent and partially explained the extremely high levels of U5MR even when the dysentery epidemic was under control.

## Mortality rates in Awok



Source: World Food Programme and Feinstein International Famine Centre, *WFP Food and Nutrition Training Toolbox*, WFP and Feinstein International Famine Centre, Tufts University, 2001

Undernutrition negatively impacts on health and economic development by reducing productivity and increasing health costs<sup>39</sup>. Children who suffer SAM or MAM between conception and the age of two are likely to pay the price of reduced cognitive development and subsequently lower income-earning potential as adults<sup>40</sup>. Equally links between malnutrition survival in childhood and an increased susceptibility to adult onset of chronic disease have been identified, especially where there has been rapid weight gain in later childhood<sup>41</sup>. This chronic disease includes obesity, coronary heart disease, diabetes and hypertension, and can significantly add to the health burden of poor households.

## Mortality

Malnutrition is a major global public health problem. It is estimated that undernutrition is responsible for 11% of the total disease burden globally and for approximately 35%<sup>42</sup> of under-5 year old mortality.<sup>43</sup> Acute malnutrition can be a direct cause of death, however more commonly; it weakens the immune system, increasing the chance of death from infectious diseases. Children who suffer from MAM are 3 times more likely to die than those who are not malnourished, and children with SAM are 9.4 times more likely to die than a child who is not malnourished. The increased mortality risk associated with

<sup>37</sup> the total number of deaths/ 10,000 people/day. The average baseline is 0.38deaths/10,000 people/day. Agencies should aim to maintain the CMR at below 1.0/10,000/day

<sup>38</sup> the total number of deaths/10,000 children under the age of 5 years/day. The average baseline is 1.03/ 10,000 children under 5 years/day. Agencies should aim to maintain the level at 2.0/10,000/day

<sup>39</sup> Taking Action, Nutrition for Survival, Growth and Development, White paper (2010), ACF International, p 13, adapted from Baker J et al, A time to act: woman are nutrition and its consequences for child survival and reproductive health in Africa. SARA, 1996

<sup>40</sup> Scaling Up Nutrition. What will it cost? (2010) Horton, S., Shekar, M., McDonald, C., Mahal, A., Krystene Brooks, J. The World Bank.

<sup>41</sup> Victora et al (2008). Maternal and child undernutrition, consequences for adult health and human capital. Lancet Series on Maternal and child undernutrition.

<sup>42</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

<sup>43</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

chronic malnutrition is roughly half that for acute malnutrition (moderately stunted children are 1.6 times more likely to die than well-nourished children, and severely stunted children 4.1 times more likely). However, the prevalence of chronic malnutrition is higher than acute malnutrition, and as a result they both account for roughly the same proportion of child deaths in high burden countries: 14.6% and 14.5% respectively.<sup>44</sup> Furthermore, maternal short stature and iron deficiency anaemia increase the risk of death of the mother at delivery, accounting for at least 20% of maternal mortality<sup>45</sup>, due to higher risk of obstructed labour and haemorrhage, respectively.

The relationship between malnutrition and mortality is complex. Although there are some emergencies where malnutrition and mortality rates have increased hand in hand, there are other examples where there is little relationship. Many factors affect mortality rates in addition to malnutrition. For example, epidemics of infectious diseases will affect both the well-nourished and the poorly-nourished.

**Case example 4** illustrates the importance of interpreting mortality data in combination with malnutrition and health information.

### Who is most vulnerable to malnutrition during an emergency?

There are different types of vulnerability to malnutrition:

- Physiological vulnerability refers to those with increased nutrient losses and those with reduced appetite
- Geographical vulnerability, which reflects their harsh or difficult living environment which may be exacerbated by distance, creating problems of access or availability of foods e.g. desert or mountain communities living in extremes of temperature.
- Political and economic vulnerability, which reflects the community status, lack of representation or isolation
- Internally Displaced People (IDPs) or refugees may temporarily or permanently be unable to access services or support, increasing their vulnerability
- Those who were vulnerable prior to the emergency due to food insecurity, poverty, gender, race, religion, land rights etc.

The groups that are physiologically vulnerable include:

- Low birth weight babies (born < 2500 grams or 5 lb 8oz) – see earlier section
- 0-59-month-old children, with 0-24 months being particularly vulnerable
- Pregnant and lactating women
- Older people and people living with disability
- Adolescents
- People with chronic illness e.g. people living with HIV and AIDS, tuberculosis

#### 0-6 months

Infants under six months are a unique group due to their feeding needs, physiological and development needs, which makes them at a much higher risk of morbidity and mortality compared to older children. Exclusive breastfeeding<sup>46</sup> is recommended from birth to 6 months followed by the introduction of appropriate complementary food at 6 months along with continued breastfeeding up to 24 months of age.

#### 6-24 months

A child has food, health and care needs that must all be fulfilled if he or she is to grow well. Most growth faltering occurs between the ages of 6 and 24 months, when the child is no longer protected by exclusive breastfeeding. At this time the child is more exposed to infection through contaminated food or water and is dependent on the mother or caregiver for frequent complementary feeding. Unfortunately, even a child adequately nourished from 24 months of age onwards is unlikely to recover growth 'lost' in the first two years as a result of malnutrition. The consequences of malnutrition on this young age group are the most serious.

#### Pregnant and Lactating women

There are increased nutrient needs during pregnancy to ensure adequate foetal growth and to build up the body in preparation for breastfeeding. Inadequate food intake during pregnancy can increase the risk of delivering a low birth weight baby. When mothers are breastfeeding they require extra energy, which they can get from the reserves they have built up during pregnancy and from eating extra food after birth. This way they can ensure the quality of breast milk for optimal growth of their infant.

<sup>44</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

<sup>45</sup> Black et al (2008). Maternal and child undernutrition: global and regional exposures and health consequences, Lancet Series on Maternal and child undernutrition.

<sup>46</sup> Breast milk with no other food or drink given to the infant

## TECHNICAL NOTES

Women and girls are more likely to be malnourished than men in most societies due to their reproductive role (often with little or no time for nutritional replenishment between pregnancies), in addition to their lower socioeconomic status, and their lack of education. Social and cultural views about foods and caring practices further exacerbate this. Around half of all pregnant women are anaemic and 100 million women in developing countries are underweight. This reduces their productivity and makes them vulnerable to illness and premature death. If they are stunted there are higher risks of complications during childbirth, and each week up to 10,000 women die from treatable complications related to pregnancy and childbirth. Infants without a mother are significantly more likely to become malnourished and die<sup>47</sup>.

The 2008 food price crisis demonstrated the negative nutritional impact on the mother<sup>48</sup>, who is often the last to benefit in a food secure household and the first to suffer in a food insecure household. This clearly influences survival, growth and development of her offspring. **The prevalence of low maternal body mass index (<18.5) has fallen in South Asia, but is still double that of African women.**<sup>49</sup>

### Adolescence

Girls' nutritional requirements increase during adolescence due to both a growth spurt and loss of iron during menstruation. Girls who become pregnant during adolescence are at an even greater risk of producing a low birth weight baby, and if they are stunted or underweight they are more vulnerable to complications during delivery.

Adolescent and child marriage continues to be a strong social norm in the developing world, particularly in Central and West Africa and South and South East Asia. Age at marriage is highly correlated with age at first birth, so naturally, raising the marriage age, means later births, and a reduced proportion of low birth weight infants. Policies and programmes to support continued education and prevent underage marriage have a significant role to play in reducing adolescent pregnancies. If rates of teenage pregnancies continue to be high, tackling anaemia and dietary intake pre-pregnancy could have significant benefits to birth outcomes.

### Older people and people living with disability

Adults with reduced appetites due to illness, psychosocial stress, age or disability often face a range of nutritional risks that can be further exacerbated by an emergency. Loss of appetite and difficulties in eating may also be common in patients suffering from motor-neurone problems. This may lead to an inadequate energy and micronutrient intake at a time when the body needs it most. Difficulties in chewing and

swallowing mean less food is eaten. Reduced mobility affects access to food and to sunlight (important for maintaining a healthy level of vitamin D status). Disabled individuals may be at particular risk of being separated from immediate family members (and usual care givers) in a disaster and it may not be easy for them to find foods they can easily eat.

### People living with chronic illness such as HIV/AIDS and tuberculosis

Malnutrition and HIV/ AIDS and/or tuberculosis can lead to:

- Weight loss, especially loss of muscle tissue and body fat
- Vitamin and mineral deficiencies
- Reduced immune function and competence
- Increased susceptibility to secondary infections
- Increased nutritional needs because of reduced food intake and increased loss of nutrients leading to rapid disease progression

People already infected with HIV/ AIDS and TB are at greater risk of physically deteriorating in an emergency because of a number of factors. These include reduced food intake due to appetite loss or difficulties in eating; poor absorption of nutrients due to diarrhoea; parasites or damage to intestinal cells; changes in metabolism; acute or chronic infections and illness and a break in supply of medications for management of disease and symptoms. There is evidence to show that the energy requirements of people living with HIV and AIDS increase according to the stage of the infection. Micronutrients are particularly important in preserving immune system functions and promoting survival. Malnutrition and HIV affect the body in similar ways. Both conditions affect the capacity of the immune system to fight infection and keep the body healthy. See Module 18 for more details.

### The intergenerational cycle of growth failure

There is an inter-generational component of malnutrition, which means that poor growth can be transmitted from one generation to the next. This is known as the cycle of malnutrition. Small women tend to give birth to LBW babies who, in turn, are more likely to become small children, small adolescents and, ultimately, small adults, who later gain too little weight in pregnancy and give birth to LBW babies. See **Figure 4**. While smallness may be genetically inherited, the vast majority of small individuals in most poor countries are small because they have suffered, or are currently suffering, from chronic and/or acute undernutrition. An important way of reducing malnutrition in the long-term, therefore, is to improve the nutritional status of girls and women so that they give birth to normal weight, healthier babies, so halting the cycle of malnutrition.

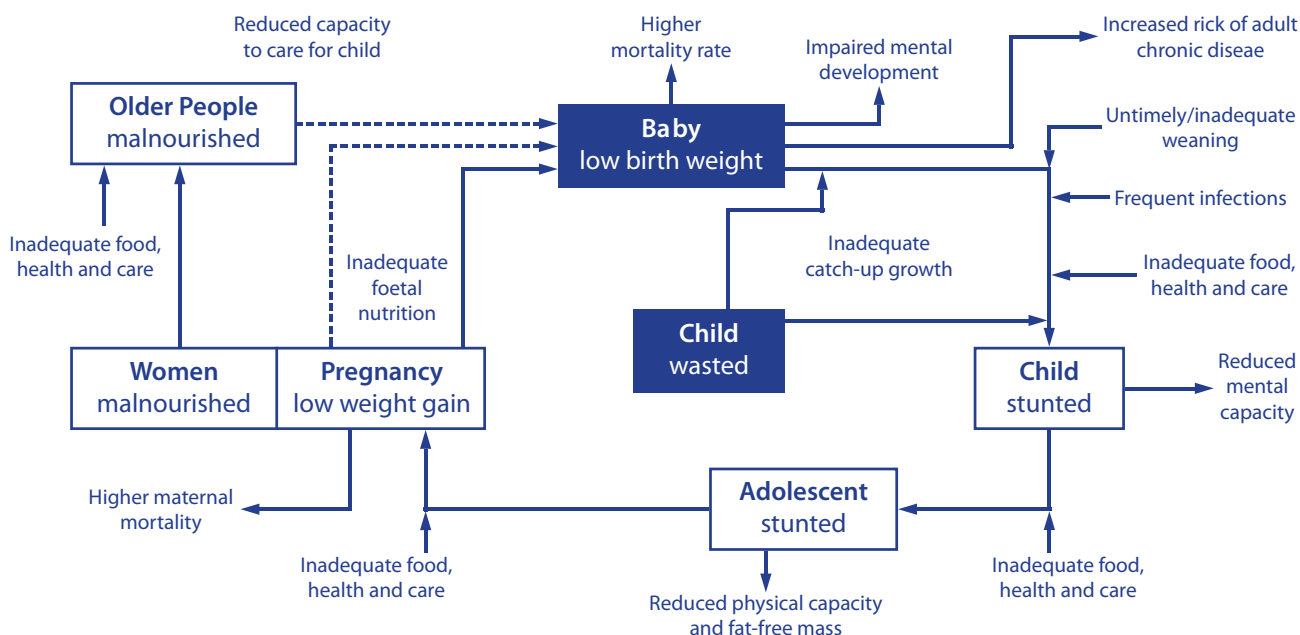
<sup>47</sup> ACF International (2010). Taking Action, Nutrition for Survival, Growth and Development, White paper, p 28

<sup>48</sup> Shrimpton, R, (2009). The impact of high food prices on maternal and child intrusion. SCN News, 37: 60-68.

<sup>49</sup> Shrimpton, R, (2009). The impact of high food prices on maternal and child intrusion. SCN News, 37: 60-68.



Figure 4: The impact of hunger and malnutrition throughout the life cycle



Source: ACF International (2010). Taking Action, Nutrition for Survival, Growth and Development, White paper.

## Changing nutrition context

Nutrition is an evolving field that needs to be understood in the context of the changing global environment. The following sections reflect the focus of the international development community.

### Food and Fuel price increase

The World Bank estimates that the food and fuel price crises since 2007 have pushed as many as 130-155 million more people into poverty and hunger<sup>50</sup>. These economic causes of malnutrition are predicted to worsen, with food prices remaining high or fluctuating and slow economic recovery. Globally, malnutrition has been gradually declining (albeit at a pace far too slow to achieve MDG 1), but this trend could be reversed by food price rises and the economic downturn.<sup>51</sup>

The proportion of undernourished people globally began rising in 2004, three years before the food and financial crisis which started in 2007. So the crisis did not create the current situation, but significantly exacerbated an existing problem. Global economic downturn resulting in soaring food prices, reduced remittances, contracting trade, reduced capital and overseas development assistance has had, and will continue to have, an impact on household purchasing power and economic stability. The trickle-down effect from reduced

government funding for health and social welfare further increases the risks of food insecurity and malnutrition in already vulnerable areas.

Households cope by reducing the quality and quantity of food that they eat, replacing foods with cheaper high carbohydrate staples, which may sustain their energy intake above the minimum requirement, but reduce their protein and micro-nutrient intakes, resulting in an increased risk of malnutrition.

From mid-2010, extreme weather events (too much or too little rainfall and drought), political turmoil, the weakening dollar and an increase in the overall demand for food and fuel have had an impact on both the stocks and buffers that protect food and fuel prices. High food prices are a major concern for low income and food deficit countries where poor households spend a large proportion of their income on food<sup>52</sup>. These food-insecure households are nutritionally vulnerable, and food shortages can trigger unrest, leading to humanitarian crises.

In 2008 the, High-Level Task Force on the Global Food Security Crisis was formed and a Comprehensive Framework for Action (CFA) was developed and driven by the UN.<sup>53</sup> To meet the immediate needs of vulnerable populations, the CFA proposed four key outcomes to be advanced through a menu of different actions: 1) emergency food assistance, nutrition interventions

<sup>50</sup> The World Bank (2009). Global Economic Prospects 2009 – Commodities at the Crossroads

<sup>51</sup> Save the children, UK (2009). Hungry for Change, An eight step, costed plan of action to tackle global child hunger.

<sup>52</sup> An average of 40-60% for the poorest households

<sup>53</sup> UN (2008). Comprehensive Framework for Action, High-Level Task Force on the Global Food Security Crisis, July 2008.

## TECHNICAL NOTES

and safety nets to be enhanced and made more accessible; 2) smallholder farmer food production to be boosted; 3) trade and tax policies to be adjusted; and 4) macroeconomic implications to be managed.

To build resilience and contribute to global food and nutrition security in the longer-term, four additional critical outcomes were put forward: 1) social protection systems to be expanded; 2) smallholder farmer-led food availability growth to be sustained; 3) international food markets to be improved; and 4) international biofuel consensus to be developed. The framework proposes that the increased needs are funded through developing countries increasing their budget allocations and developed countries increasing their development assistance to 0.7% Gross National Income.

### Climate change and nutrition security

Climate change negatively affects nutrition security by directly impacting upon the immediate, underlying and basic causes of undernutrition. Undernutrition in turn, undermines the resilience to shocks and coping mechanisms of vulnerable population groups, reducing their capacity to resist and adapt to the consequences of climate change<sup>54</sup>. Climate change leads to food shortages, which in turn lead to rising food prices and an increased risk of political turmoil, threatening national and regional security, as seen recently in the Middle East.

Climate change directly affects the food and nutrition security of millions of people, and yet there is still little cohesion between the nutrition and food security communities and those working on climate change and disaster risk reduction (DRR). Multi-sectoral, nutrition-sensitive approaches to sustainable and climate-resilient agriculture, health and social protection schemes will strengthen DRR, and increase the focus on nutritionally vulnerable mothers and young children<sup>55</sup>.

### Urbanisation

The proportion of the global population living in urban areas surpassed the population living in rural areas in 2009. By 2050 the urban population is predicted to reach 6.3 billion and globally 69% of the population will be urbanised. Although South and East Asia have the highest urban populations, the largest growth in urbanisation is predicted in Africa<sup>56</sup>.

Urban food security is typified by higher food costs, due to the need to purchase the majority or all of the household food and non-food needs, as well as insecure, often informal employment, with little or no support from social networks. A

higher dependency ratio of children to adults reflects the lack of extended family and is exacerbated by the need for women to be involved in income-generating activities. This vulnerability is often exacerbated by the increased frequency and scale of climatic shocks, spikes in food and fuel prices, and displacement, which further erode assets, coping mechanisms and the potential to recover from shocks.

Experience in both 2008 and recently in the Middle East/North Africa demonstrates the strategic sensitivity of urban settlements to civil unrest in times of food insecurity. However, while such instances have helped to focus attention on the situation of the urban poor, it has remained difficult for the humanitarian sector to respond to urban crises.

Urban malnutrition has typically been considered less concerning than rural malnutrition, due to availability of food in urban areas. The scale of the problem of malnutrition in urban contexts is largely hidden, given that few wide-scale anthropometric surveys are undertaken in these contexts. Disparities in economic status between groups can also be obscured through anthropometric surveys with only a single estimate of GAM for the population, while sampling to get estimates of GAM for separate groups can be resource intensive. Population density, issues of overcrowding and disease transmission, along with higher HIV and TB levels, poor sanitation and limited capacity for household level agricultural production, exacerbate the underlying causes of malnutrition. For example, food access is often more of an issue than food availability<sup>57</sup>.

There is some indication<sup>58</sup> that levels of acute and chronic malnutrition in 'pockets' of urban informal settlements are as high as in rural areas. These high rates are due to a poor public health environment, poor care practices (infants breastfed for a shorter duration, and less time spent with the mother), high levels of food and income insecurity and a poor quality diet (low micronutrient and protein intake).

### Gender

Evidence shows that a reduction in gender inequality is an important part of the solution in addressing global hunger. When women are given the opportunity to control resources and income, it has repeatedly been shown to have positive influences on household health and nutrition. As expected, there are positive associations between female primary school attendance and a reduction in country level poverty rates, and subsequently malnutrition. Empowering women in terms of education, political participation and control and access to assets and resources has the potential to improve purchasing

<sup>54</sup> United Nations System. Standing Committee on Nutrition (2010) Climate change and nutrition security, Cancun.

<sup>55</sup> United Nations System. Standing Committee on Nutrition (2010) Climate change and nutrition security, Cancun.

<sup>56</sup> United Nations, Department of Economic and Social Affairs (2010) Revision of World Urbanisation Prospects.

<sup>57</sup> HTP module 12 Management of Acute Moderate Malnutrition

<sup>58</sup> Personal communication with Lynnnda Kiess (WFP/HKI) indicates that urban surveys in informal settlements in East Asia showed high rates of chronic and acute malnutrition in the urban informal settlements

Table 1: World's hungry<sup>59</sup> people, in millions, 1990-2015<sup>60</sup>

Year	1990	1995	2005	2007	2008	2009	2015 goal
<b>Hungry people in the world (millions)</b>	842	832	848	854	923	1,000	<b>600</b>

power, knowledge of nutrition and ultimately a defeminisation of malnutrition.<sup>61</sup>

Policy and programmes aimed at improving women's access to land (heritage entitlements, legislation), credit, agricultural inputs, technology, and training all help to reduce the cultural, traditional and sociological constraints women in developing countries are faced with, and all support change for the better.

At the household level it is important to understand the gender dynamics and disaggregate data in order to identify which age groups or gender, are more vulnerable. An example of this might be intra-household allocation of food, which can favour maturity and gender in some cultures.

### Nutrition policy, initiatives, goals and guidelines

The last 3 years have seen a surge in nutrition-related policies and initiatives, which aim to redress the 'medicalization' of nutrition over the previous 10 years and instead find a balance between treating malnutrition and addressing the immediate, underlying and basic causes through integrated programme and policy approaches.

The **Millennium Development Goals (MDGs)** were adopted by 189 countries in 2000. The eight goals are interrelated, and progress in any of them will play a role in ending acute and chronic undernutrition. One of the key targets under MDG 1 (1c) is 'to reduce by half the proportion of people who suffer from hunger<sup>62</sup> by 2015 (as compared with 1990). This MD target is measured against the percentage of children under-five years who are underweight, and the proportion of the population below the minimum level of dietary energy consumption (i.e. who are 'hungry').

Although the portion of undernourished children under-five has dropped from 33% in 1990 to 26% in 2006, the worldwide number of undernourished people is continuing to rise due to population growth in countries<sup>63</sup>. MDGs 2 to 6 all have direct

or indirect impacts on malnutrition if achieved, and vice versa. Eighty per cent of the world's stunted children live in just 20 countries. Fourteen of these countries are not on track to achieve MDG 1 and nine of them are in Africa. The table below outlines the goal of reducing the world's hungry people to 600 million by 2015. Given that the figures from 2009 greatly exceed this goal it currently looks unachievable.

Humanitarian reform in 2005 led to a new structure, which includes the Inter-agency standing committee (IASC) **cluster approach**. The Nutrition Cluster, with UNICEF as the lead agency, is one of 12 sectoral clusters, Cluster lead objectives include providing sectoral leadership, strengthening preparedness and technical capacity and enhancing partnerships.

### Important advocacy papers have led to strategy changes and ultimately new programme and donor guidance.

**Save the Children UK's Hungry for Change paper**,<sup>64</sup> (2009) argues the importance of addressing malnutrition in the first 33 months of life and the costs related to this in 8 focus countries. Importantly for British Government funding, **DFID's nutrition strategy** 'The neglected crisis of undernutrition'<sup>65</sup> (February 2010), acknowledges the lack of MDG 1 progress and aims to address this through investing in multiple sectors to deliver improved nutrition. The ACF white paper (May 2010) added ACF International's voice to a number of other publications in advocating for increased attention to the problem of undernutrition, focusing on acute malnutrition, and intended to influence policy makers, both nationally and globally. **The EU Humanitarian Food Assistance Communication**<sup>66</sup> (2010) recognises that adequate food consumption does not in itself ensure adequate nutrition and that there need to be complementary interventions to address the underlying causes of malnutrition. The American **USAID/OFDA guidelines** (2008) for unsolicited proposals emphasise a complementary approach, and have a strong focus on education in infants and young child feeding<sup>67</sup>; and the **Food for Peace** title II food aid programmes (2011) have shifted towards

<sup>59</sup> FAO does an annual calculation of calories produced and imported/exported per country and total needs. Based on population size 'hunger' is calculated.

<sup>60</sup> FAO (2009). The state of Food Insecurity in the World 2002-2009

<sup>61</sup> United Nations Standing Committee on Nutrition (UNSCN) (2010). Progress in Nutrition – 6th report on the world nutrition situation.

<sup>62</sup> Hunger is measured using the proportion of underweight children under 5 years of age and the proportion of the population below the minimum level of dietary energy consumption in a given country.

<sup>63</sup> United Nations System. Standing Committee on Nutrition (UNSCN) (2010). Sixth report on the World Nutrition Situation: Progress in nutrition. UNSCN, Geneva.

<sup>64</sup> Save the children, UK (2009). Hungry for Change, An eight step, costed plan of action to tackle global child hunger.

<sup>65</sup> Department for International Development (2010). The neglected crisis of undernutrition: DFID's Strategy.

<sup>66</sup> Communication from the Commission to the Council and the European Parliament, Humanitarian Food Assistance, European Commission, Oct 2010.

<sup>67</sup> USAID / OFDA (2008) Guidelines for unsolicited proposals and reporting.

## TECHNICAL NOTES

using nutrition indicators as well as measurements of metric tonnage delivered<sup>68</sup>. Although small shifts these are important changes in American donor guidance.

The UNSCN and other agencies are supporting the Scaling-Up Nutrition (SUN) framework for action and subsequent road map<sup>69</sup>, which has identified actions and investments required to scale up nutrition programming and highlights key working principles for getting there. The **World Bank's paper 'Scaling up Nutrition – what will it cost?'<sup>70</sup>** (2010), analyses the financial burden of undernutrition. It calculates the cost of addressing this with various interventions in the 36 countries with the highest burden of undernutrition. They calculate that an additional \$10.3 billion US dollars per year is required from public resources to successfully reduce undernutrition on a world-wide scale.

**Integrated food security Phase Classification (IPC)** is a standardised tool for early warning that aims at providing a 'common currency' for classifying food security, developed by the FAO Food Security and Nutrition Analysis Unit (FSNAU)<sup>71</sup>. Using a common scale, which is comparative across countries, makes it easier for donors, agencies and governments to identify and prioritise countries for intervention. The tool includes nutrition, health, water, sanitation and food security data, as well as chronic and acute level malnutrition cut-offs, and is an increasingly useful indicator for defining emergency response<sup>72</sup>.

**The evolving nature of the treatment of severe acute malnutrition for both infants and children has led to the development of important analyses and nutrition guidelines.**

These include the Community-based therapeutic care (CTC) manual<sup>73</sup> from which many national governments have developed new guidelines (or revised existing inpatient-only guidelines) to promote the community-based management of acute malnutrition approach (CMAM, the new name for CTC). The joint statement by WHO, WFP, UNSCN and UNICEF in 2007 on community-based management of severe acute malnutrition<sup>74</sup> outlined the evidence of the community-based approaches, and identified the role of each of these agencies in supporting partners during emergencies. Furthermore, the Management of Acute Malnutrition in Infants (MAMI)<sup>75</sup> project in 2009 reviewed existing evidence on the often difficult management of acute malnutrition in infants under-six months' old and provided interim guidance while highlighting gaps for essential research. Treatment of malnutrition is addressed in modules 12, 13 and 14.

The WHO child growth standards (2006)<sup>76</sup> were developed using data collected in the WHO Multicentre Growth Reference Study. These new standards demonstrate for the first time that children born in different regions of the world, when given the optimum start in life, have the potential to grow and develop to within the same range of height and weight for their age. The standards are also used for detecting children not growing to full capacity or those who are under- or overweight on average. The new standards establish breastfeeding as the biological norm and the breastfed infant as the standard for growth and development. Previous reference charts were based largely on the growth of infants in the USA fed formula milk; in contrast, the WHO Child Growth Standards are global, and for all children.

<sup>68</sup> Food for Peace 2011 Title II Development Food Aid Programs

<sup>69</sup> Scaling Up Nutrition (SUN), 2010. Scaling up nutrition: a framework for action.

<sup>70</sup> Horton, S., Shekar, M., McDonald, C., Mahal, A., Krystene Brooks, J. (2010). Scaling Up Nutrition. What will it cost? The World Bank.

<sup>71</sup> Supported by FSNAU technical and managerial support is provided by FAO

<sup>72</sup> <http://www.ipcinfo.org/attachments/ReferenceTableEN.pdf>

<sup>73</sup> Valid International (2006). CTC: Community based therapeutic care – A field manual.

<sup>74</sup> WHO, WFP, UNSCN, UNICEF (2007) Community based management of severe acute malnutrition, a joint statement.

<sup>75</sup> ENN, UCL-CIHD, ACF (2009). Management of acute malnutrition in infants (MAMI) project. A retrospective review of the current field management of moderately and severely malnourished infants under six months of age.

<sup>76</sup> WHO (2006). WHO child growth standards.

# PART 3: TRAINER'S GUIDE

The trainer's guide is the third of four parts contained in this module. It is NOT a training course. This guide provides guidance on how to design a training course by giving tips and examples of tools that the trainer can use and adapt to meet training needs. The trainer's guide should only be used by experienced trainers, to help develop a training course which meets the needs of a specific audience. The trainer's guide is linked to the technical information found in Part 2 of the module.

Module 3 is about understanding malnutrition. Classifying different types of malnutrition is an important step towards prevention and treatment in both emergency and non-emergency situations. You are most likely to be asked to train field workers working on, or preparing for emergency response programmes where there is a risk of increased malnutrition and death. It is possible, however, that senior managers may want a short practical briefing on the classification of malnutrition so as to become familiar with its different forms and the links between malnutrition, illness and death.

**Note: This module should be followed by Module 6 for more understanding of the classification of undernutrition according to anthropometric criteria.**

### Navigating your way around the guide

The trainer's guide is divided into six sections.

1. **Tips for trainers** provide pointers on how to prepare for and organize a training course.
2. **Learning objectives** set out examples of learning objectives for this module that can be adapted for a particular participant group.
3. **Testing knowledge** contains an example of a questionnaire that can be used to test participants' knowledge of undernutrition either at the start or at the end of a training course.
4. **Classroom exercises** provide examples of practical exercises that can be done in a classroom context either by participants individually or in groups.
5. **Case studies** contain examples of case studies (one from Africa and one from another continent) that can be used to get participants to think by using real-life scenarios.
6. **Field-based exercises** outline ideas for field visits that may be conducted during a longer training course.

# CONTENTS

## 1. Tips for trainers

## 2. Learning objectives

## 3. Testing knowledge

**Exercise 1:** What do you know about malnutrition?

**Handout 1a:** What do you know about malnutrition?: Questionnaire

**Handout 1b:** What do you know about malnutrition?: Questionnaire answers

## 4. Classroom exercises

**Exercise 2:** Can you identify the signs of undernutrition correctly?

**Handout 2a:** Can you identify the signs of undernutrition correctly?: Model answers

**Exercise 3:** Clarifying nutritional terms

**Handout 3a:** Definitions of key terms in nutrition

**Exercise 4:** Which part of the world is most affected by undernutrition?

**Handout 4a:** Which part of the world is most affected by undernutrition?

**Handout 4b:** Which part of the world is most affected by undernutrition?: Model answer

## 5. Case studies

**Exercise 5:** Identifying those vulnerable to malnutrition

**Handout 5a:** Case study I: Size of the nutrition problem in the Philippines

**Handout 5b:** Case study I: Size of the nutrition problem in the Philippines: Model answers

**Handout 5c:** Case study II: Size of the nutrition problem in the Occupied Palestinian Territory

**Handout 5d:** Case study II: Size of the nutrition problem in the Occupied Palestinian Territory: Model answers

## 6. Field-based exercises

**Handout 6a:** Identifying different forms of malnutrition

# 1. Tips for trainers

## Step 1: Do the reading!

- Read Parts 1 and 2 of this module.
- Familiarise yourself with the technical terms from the glossary.
- Read through the following key documents (see full references and how to access them in Part 4 of this module):
  - The Sphere Project (2011). Sphere Handbook, 'Chapter 3: Minimum Standards in Food Security and Nutrition'. Sphere Project, Geneva.
  - Department for International Development (2010). The neglected crisis of undernutrition: DFID's Strategy.
  - ACF International (2010). Taking Action, Nutrition for Survival, Growth and Development, White paper.
  - FANTA (2008). Trainers Guide – Community Based Management of Acute Malnutrition (CMAM).
  - Lancet (2008). Lancet series on Maternal and child undernutrition. Summary can be found at: <http://fex.enonline.net/33/summary.aspx>
  - FAO (2007). Distance Learning Course: Nutritional Status Assessment and Analysis, Learner Notes, Part 1. Rome: FAO. (3 pages).
  - Young, H. and Jaspars, S. (2006). The Meaning and Measurement of Malnutrition in Acute Emergencies. Humanitarian Practice Network Paper, No. 56. London: Overseas Development Institute.
- Refer to **Module 4** on micronutrient deficiency diseases and **Module 6** on anthropometric measurements as complementary reading on how malnutrition is classified and measured.
- Be sure that you take time to read the exercises and model answers so that you can decide if they meet your training objectives.
- Decide which sessions to include and within sessions, which activities to include.

## Step 2: Know your audience!

- Find out about your participants in advance of the training:
  - How many participants will there be?
  - Have any of the participants already seen cases of undernutrition through growth monitoring activities at mother and child health clinics or otherwise?
  - Could participants with experience be involved in the sessions by preparing a case study or contribute through describing their practical experience?

## Step 3: Design the training!

- Decide how long the training will be and what activities can be covered within the available time. In general, the following guide can be used:
  - A **90-minute** classroom-based training session can provide a basic overview of the forms of undernutrition.
  - A **half-day** classroom-based training session can provide an overview of definitions of undernutrition and include practical exercise 3 or 4.
  - A **one-day** classroom-based training session can provide a more in-depth understanding of definitions of undernutrition and include all three practical exercises and/or one case study.
  - Combine Modules 3 and 4 for fuller coverage of the topic in two half-day sessions.

## TRAINER'S GUIDE

- Identify appropriate learning objectives. This will depend on your participants, their level of understanding and experience, and the aim and length of the training.
- Decide exactly which technical points to cover based on the learning objectives that you have identified.
- Divide the training into manageable sections. One session should generally not last longer than an hour.
- Ensure the training is a good combination of activities, e.g., mix PowerPoint presentations in plenary with more active participation through classroom-based exercises; mix individual work with group work.
- This module is a theoretical session and visual aids, such as photos, will make it much easier to identify forms of undernutrition. No matter who your audience is, take time to explain the technical terms highlighted in italics, as this module provides the basics for many of the modules that follow.
- Be sure to emphasise that undernutrition is often of the chronic, silent type that goes unnoticed, but that acute malnutrition can set in very quickly in populations already suffering from chronic malnutrition. Think of examples of places and populations this applies to (see technical notes).

**Step 4: Get prepared!**

- Prepare PowerPoint presentations with notes (if they are going to be used) in advance and conduct a trial run. Time yourself!
- Recommended PowerPoint presentations that can be adapted from existing sources include (see full references and how to access them in Part 4 of this module):

**Existing PowerPoints for a session on understanding malnutrition**

	<b>Author</b>	<b>Session</b>
1.	FAO (2007). Distance Learning Course – Nutritional Status Assessment and Analysis <a href="http://www.foodsec.org/dl/dlintro_en.asp">http://www.foodsec.org/dl/dlintro_en.asp</a>	Part 1: PowerPoint and trainer notes
2.	<b>Trainers Guide – Community Based Management of Acute Malnutrition.</b> <a href="http://www.fantaproject.org/cmam/training.shtml">http://www.fantaproject.org/cmam/training.shtml</a>	
3.	<b>FAO Training Package of Materials for the Course Food and Nutrition Surveillance and Emergency.</b> <a href="http://www.unscn.org/en/resource_portal/index.php?types=9">http://www.unscn.org/en/resource_portal/index.php?types=9</a>	Unit II. Session 7. Overview of malnutrition in emergencies
4.	Nutrition Works. Nutrition In Emergencies Training Course (now housed by Westminster University, London) Contact <a href="mailto:k.godden@westminster.ac.uk">k.godden@westminster.ac.uk</a>	What is malnutrition?

- Prepare exercises and case studies. These can be based on the examples given in this trainer's guide but should be adapted to be suitable for the particular training context.
- Prepare a 'kit' of materials for each participant. These should be given out at the start of the training and should include:
  - Timetable showing break times (coffee and lunch) and individual sessions
  - Handouts, including Parts 1, 2 and 4 of this module plus exercises as required
  - Pens and paper, flip charts and markers, as necessary



**REMEMBER**

People remember 20% of what they are told, 40% of what they are told and read, and 80% of what they find out for themselves.

People learn differently. They learn from what they read, what they hear, what they see, what they discuss with others and what they explain to others. A good training is therefore one that offers a variety of learning methods which suit the variety of individuals in any group. Such variety will also help reinforce messages and ideas so that they are more likely to be learned.

## 2. Learning objectives

Below are examples of learning objectives that could be adapted for training on understanding malnutrition. Trainers may wish to develop alternative learning objectives that are appropriate to their particular participant group. The number of learning objectives should be limited; up to five per day of training is appropriate. Each exercise should be related to at least one of the learning objectives.

### Examples of learning objectives

At the end of the training participants will:

- Be able to identify various forms of undernutrition.
- Be familiar with technical terms that describe malnutrition.
- Understand the consequences of undernutrition for individuals in emergency situations.
- Understand the impact of food prices, urbanisation and climate change on malnutrition.
- Understand the links between nutrition, health, food insecurity and mortality.
- Be aware of who is specifically vulnerable to malnutrition and why.
- Be aware of the global prevalence of malnutrition.
- Be aware of the latest policy and strategy positions in order to understand malnutrition

## 3. Testing knowledge

This section contains one exercise, which is an example of a questionnaire that can be used to test participants' understanding of malnutrition either at the start or at the end of a training session. The questionnaire can be adapted by the trainer, to include questions relevant to the specific participant group.

### Exercise 1: What do you know about malnutrition?

#### What is the learning objective?

- To test participants' knowledge about definitions and types of malnutrition

#### When should this exercise be done?

- *Either* at the start of a training session to establish knowledge level
- *Or* at the end of a training session to check how much participants have learned

#### How long should the exercise take?

- 20 minutes

#### What materials are needed?

- **Handout 1a:** What do you know about malnutrition?: Questionnaire
- **Handout 1b:** What do you know about malnutrition?: Questionnaire answers

#### What does the trainer need to prepare?

- Familiarise yourself with the questionnaire questions and answers.
- Add your own questions and answers based on your knowledge of the participants and their knowledge base.

#### Instructions

**Step 1:** Give each participant a copy of Handout 1a.

**Step 2:** Give participants 15 minutes to complete the questionnaire working alone, or in pairs.

**Step 3:** Give each participant a copy of Handout 1b.

**Step 4:** Give participants 5 minutes to mark their own questionnaires and clarify the answers where necessary

## Handout 1a: What do you know about malnutrition? Questionnaire

**Time for completion:** 15 minutes

**Answer all the questions. (Choose one answer only for each question)**

**Note that for some questions there is only ONE correct answer while for other questions there are SEVERAL correct answers.**

1. Which of these does not describe forms of malnutrition? *Circle the correct answer.*

- a) Chronic and acute undernutrition
- b) Wasting and growth failure
- c) Overnutrition and undernutrition
- d) Clinical and serious

2. True or false?

Everybody needs the same amount of macro and micronutrients for an adequate diet.

3. Which term best describes growth failure? *Circle the correct answer.*

- a) Thinness
- b) Low birth weight
- c) Stunting
- d) Wasting

4. Which of these are examples of micronutrients? *Circle the correct answers.*

- a) Vitamin A
- b) Protein
- c) Zinc
- d) Mineral water

5. Acute malnutrition is classified through: *Circle the correct answers.*

- a) Clinical signs
- b) Clinical history
- c) Biochemical markers
- d) Anthropometric measurements

6. Which of these does not describe forms of malnutrition? *Circle the correct answer.*

- a) Showing symptoms of severe acute malnutrition
- b) Showing symptoms of moderate acute malnutrition
- c) Showing symptoms of growth failure
- d) Showing symptoms of micronutrient deficiency diseases

7. True or false?

Mortality increases exponentially with declining nutritional status

8. Pregnant women have additional nutritional needs to ensure: *Circle the correct answers.*
- a) Adequate foetal growth
  - b) Adequate nutritional status of their children
  - c) Reserves for breastfeeding
  - d) Reducing the risk of delivering a low birth weight baby
9. True or false?  
During an emergency situation, people already infected with HIV are always the ones with the greatest risk of malnutrition.
10. Where is the rate of underweight children highest? *Circle the correct answer.*
- a) South America
  - b) South Africa
  - c) East Africa
  - d) South Asia
11. What does the double burden of malnutrition refer to? *Circle the correct answers.*
- a) Acutely malnourished child and obese mother
  - b) Stunting and wasting in the same individual
  - c) High levels of heart disease and acute malnutrition in the same community
12. Which of these global phenomena influence undernutrition? *Circle the correct answers.*
- a) Climate change
  - b) Food prices
  - c) Fuel prices
  - d) Global economy
  - e) Gender inequality

## Handout 1b: What do you know about malnutrition?: Questionnaire answers

1. Which of these does not describe forms of malnutrition?

- a) Chronic and acute
- b) Wasting and growth failure
- c) Overnutrition and undernutrition
- d) **Clinical and serious**

**There are many ways of classifying malnutrition. The most common include differentiating undernutrition from overnutrition, chronic from acute forms, and within acute forms, the moderate from severe forms. Clinical malnutrition does not exist; clinical examination is a method for diagnosing malnutrition.**

2. True or **false**?

Everybody needs the same amount of macro and micronutrients for an adequate diet.

**Nutrient requirements are dependent on age, sex, body weight, level of physical activity, growth, health status, and outside temperature. They are therefore very varied.**

3. Which terms best describes growth failure?

- a) Thinness
- b) **Low birth weight**
- c) **Stunting**
- d) **Wasting**

**Thinness is not necessarily a form of malnutrition. Low birth weight describes intra-uterine growth failure, applicable to growth during gestation. Stunting describes chronic malnutrition which is a form of growth failure. Wasting describes acute malnutrition which can be a sign of growth failure, but may not be if the affected person is an adult or the acute malnutrition is very short term.**

4. Which of these are examples of micronutrients?

- a) **Vitamin A**
- b) Protein
- c) **Zinc**
- d) Mineral water

**Micronutrients are the collective name for minerals and vitamins and include Vitamin A and Zinc. Protein is one of three macronutrients, with carbohydrate and fat. Mineral water may contain micronutrients but in minute amounts, and it is often unavailable to vulnerable individuals.**

5. Acute malnutrition is classified through: *Circle the correct answer.*

- a) **Clinical signs**
- b) Clinical history
- c) Biochemical markers
- d) **Anthropometric measurements**

**Acute malnutrition refers to wasting, measured by weight-for-height, or through clinical signs of bilateral pitting oedema. Biochemical markers can measure the status of certain micronutrients such as iodine and iron, but these are not good proxy indicators for acute malnutrition.**

6. **True** or false?

Mortality increases exponentially with declining nutritional status

**The risk of death is greater among the severely malnourished than the moderately malnourished.**

7. Pregnant women have additional nutritional needs to ensure:

- a) **Adequate foetal growth**
- b) Adequate nutritional status of their children
- c) **Reserves for breastfeeding**
- d) **Reducing the risk of delivering a low birth weight baby**

**Answers a, c, and d place extra energy requirements on pregnant women, the nutritional status of their other children is dependent on more than maternal nutritional health status, such as household food security, care practices and health environment.**

8. True or **false**?

During an emergency situation, people already infected with HIV are always the ones with the greatest risk of malnutrition.

**While HIV status and nutritional risk are associated, in an emergency situation, it is necessary to identify which groups are affected in relation to the cause of the emergency. For example, in floods or drought situations, people with HIV may be one of the groups that are cut off from their normal food sources and caring practices may be affected, but children, elderly and people with other chronic diseases will also be at risk. It is necessary to evaluate the risk of malnutrition of all vulnerable groups in an emergency**

9. Where is the rate of underweight children highest?

- a) South America
- b) South Africa
- c) East Africa
- d) **South Asia**

**A total of 27 per cent of children in South Asia are underweight. There are 129 million underweight children in low- and middle-income countries in the world.**

10. What does the double burden of malnutrition refer to? *Circle the correct answers.*

- a) **Acutely malnourished child and obese mother**
- b) Stunting and wasting in the same individual
- c) **High levels of heart disease and acute malnutrition in the same community**

The double burden of malnutrition can occur within the same household and within the same or different communities in the same country.

11. Which of these global phenomena influence undernutrition? *Circle the correct answers.*

- a) **Climate change**
- b) **Food prices**
- c) **Bio fuel prices**
- d) **Global economy**
- e) **Gender inequality**

**All of these phenomena influence either directly or indirectly the global and national rates of undernutrition.**

## 4. Classroom exercises

This section provides examples of practical exercises that can be carried out in a classroom context either by participants individually or in groups. Practical exercises are useful between plenary sessions, where the trainer has done most of the talking, as they provide an opportunity for participants to engage actively in the session. The choice of classroom exercises will depend upon the learning objectives and the time available. Trainers should adapt the exercises presented in this section to make them appropriate to the particular participant group. Ideally, trainers should use case examples with which they are familiar.

### Exercise 2: Can you identify the signs of undernutrition correctly?

#### What is the learning objective?

- To be able to identify various forms of undernutrition

#### When should this exercise be done?

- *Either* at the beginning to gauge your participants' knowledge
- *Or* half way through the session once the main concepts related to undernutrition have been covered

#### How long should the exercise take?

- 30 minutes

#### What materials are needed?

- PowerPoint slides with photos for trainer
- **Handout 2a:** Identifying signs of malnutrition correctly: Model answers

#### What does the trainer need to prepare?

- Six to eight PowerPoint slides showing different forms of malnutrition

#### Instructions

**Step 1:** Divide the participants into groups of three or four people.

**Step 2:** Explain to the group that you will present some slides illustrating different forms of malnutrition. Ask them to discuss each slide in their group, identify any possible clinical symptoms and agree on what form of malnutrition it might be.

**Step 3:** (10 min.) Show six to eight power point slides illustrating different forms of malnutrition.

**Step 4:** (20 min.) Groups report back their conclusions to plenary.

#### Discussion points for feedback in plenary

- ➔ Encourage discussion on what may have led to this type of malnutrition.
- ➔ Emphasize that it is not easy to visually detect mild forms of wasting, stunting or micronutrient deficiencies.



**Handout 2a: Can you identify signs of undernutrition correctly?: Model answers**

Note that chronic malnutrition is much more difficult to detect with the naked eye. Do not be surprised if Slides 4, 8 and 9 prove to be too difficult for the group to assess correctly. Emphasize this point.

Slide 1 Wasting – severe acute malnutrition

Slide 2 Stunting – chronic malnutrition

Slide 3 Low birth weight

Slide 4 Severe acute malnutrition – Kwashiorkor with bilateral pitting oedema

**Exercise 3: Clarifying nutritional terms****What is the learning objective?**

- To be familiar with technical terms that describe malnutrition

**When should this exercise be done?**

- Steps 1 and 2 work best at the beginning of the session, as a warm up.
- Step 3 works best at the end as a wrap up.

**How long should the exercise take?**

- 20 to 30 minutes for Steps 1 and 2
- 30 minutes for Step 3

**What materials are needed?****Steps 1 and 2:**

- Blackboard
- Up to 30 white pieces of paper for group work
- Bluetack or tape to stick paper on blackboard
- **Handout 3a:** Definitions of key terms in nutrition

**Steps 3:**

- The following 10 technical terms written separately on coloured pieces of paper:
  - i. Underweight
  - ii. Stunting
  - iii. Marasmus
  - v. Micronutrient deficiencies
  - v. Wasting
  - vi. Kwashiorkor
  - vii. Undernutrition
  - viii. Overnutrition
  - ix. Macronutrients
  - x. Acute malnutrition
  - xi. Obese
  - xii. Overweight
  - xiii. Chronic malnutrition
  - xiv. Bilateral pitting oedema
- Definitions of the terms below from **Handout 3a** written out on separate pieces of white paper the same size and shape as the 30 white pieces of paper used in Step 2.

**Instructions****Step 1:** (10-20 min.)

- ▶ Write 'Nutrition' on the flipchart and ask participants: *"What words or phrases come to mind when you think of the word 'nutrition'?"*

**Exercise 3: Clarifying nutritional terms** (continued)

- ▶ Get three or four participants to come and write up their ideas. They may come up with ideas such as:
  - Protein, minerals, fat, carbohydrates
  - Food people eat
  - What the body needs to live
  - Nourishment for good growth
- ▶ Encourage the group to use these words and phrases to come up with a short definition of nutrition.
- ▶ Write up and discuss various suggestions. Rewrite these until you have a good working definition that everyone is happy with. Make sure that the definition refers not just to the food people eat, but also to how food is used to produce energy to maintain life and growth.
- ▶ An example of a definition: *'Nutrition is the outcome of the food eaten (the diet) and it manifests as good growth and energy to conduct activities and fight infection'*.
- ▶ Add 'mal' to the beginning of the word 'nutrition' on the board and ask what it means. Then ask what *malnutrition* means. Make sure that participants understand that malnutrition includes overnutrition and undernutrition.

**Step 2:** (15-20 min.)

- ▶ Ask the participants if they know any terms used to describe different forms of malnutrition.
- ▶ Stick terms on coloured pieces of paper on the blackboard as they are called out.
- ▶ Stick all remaining pieces of paper on the board.
- ▶ Divide the participants into groups of three or four people.
- ▶ Give each group two pieces of white paper and two of the coloured pieces of paper from the board.
- ▶ Ask each group to discuss what the nutritional terms they have been given mean and to write a definition of each on the white paper.
- ▶ Give groups five minutes then collect all the white and coloured pieces of paper. Tell participants you will use them later on in the session.
- ▶ Give out Handout 3a and ask groups to check the definitions for a few minutes and discuss in their group if they felt their definition was close to that on the handout for the terms they each defined.
- ▶ Finally ask the group how easy that was and which terms were least familiar. Explain they will be covered in the session.

**Step 3: To be done at the end of the session** (30 min.)

- ▶ Fold up all the pieces of coloured and white paper you received from the participants.
- ▶ Add to them the 10 definitions you prepared before the session, by folding them in the same way.
- ▶ Mix them and randomly distribute all the coloured and white pieces of paper to the participants. There should be 10 coloured pieces of paper and 20 definitions on white paper. Ask everyone to look at their paper.
- ▶ Ask a participant with a coloured piece of paper to read aloud what it says.
- ▶ Ask the participant who thinks they have the correct definition of this term on a piece of white paper to stand up and read it aloud. There should be one definition you have prepared and one definition prepared by the groups in Step 2 of this exercise.
- ▶ Ask the group to decide which definition is correct. Repeat this until all the coloured pieces of paper are finished.
- ▶ Ask if these terms are now clear to everyone. If not, spend time going over queries.

## Handout 3a: Definitions of key terms in nutrition

**Nutrition** is a broad term referring to processes involved in eating, digestion and utilisation of food by the body for growth and development, reproduction, physical activity and maintenance of health.

**Malnutrition** includes both **undernutrition** (acute malnutrition, i.e. wasting and/or nutritional oedema; chronic malnutrition, i.e. stunting; micronutrient malnutrition; and inter-uterine growth restriction, i.e. poor nutrition in the womb), and **overnutrition** (overweight and obesity).

**Nutrients** are the smallest particles in food that must be provided to the body in adequate amounts. They include protein, fats, carbohydrates (macronutrients), vitamins, minerals (micronutrients), water and fibre.

**Nutritional status** is the health status of an individual as determined by the utilization of nutrients.

**Undernutrition** is an insufficient intake of energy, protein or micronutrients, that in turn leads to nutritional deficiency

**Overnutrition** is an excess intake of energy, protein or micronutrients, which leads to an individual becoming overweight and eventually obese. A person is overweight when their body mass index (weight/height<sup>2</sup>) is between 26 and 30.

**Body Mass Index (BMI)** is an index of nutritional status in adults measured using body mass index or weight/height<sup>2</sup>

**Overweight** A person is overweight when their body mass index (weight/height<sup>2</sup>) is between 26 and 30.

**Underweight** Wasting or stunting or a combination of both, measured through the weight-for-age nutritional index

**Chronic malnutrition** or **Stunting** Chronic malnutrition, also known as stunting, is a sign of 'shortness' and develops over a long period of time. In children and adults, it is measured through the height-for-age nutritional index.

**Acute malnutrition** (wasting and/or nutritional oedema), is caused by a decrease in food consumption and/or illness resulting in sudden weight loss or oedema. Acute malnutrition is defined by a low weight-for-height, by visible wasting or by the presence of nutritional oedema.

**Food security** When all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

**Nutrition Security** is achieved when secure access to appropriate nutritious food is coupled with a sanitary environment alongside adequate health services and care. This ensures a healthy and active life for all household members.

**Hunger** is often used to refer in general terms to MDG1 and food insecurity.

**Double burden of malnutrition** When under- and overnutrition occur simultaneously, reflecting the consequences of poor nutrition security.

**Low birth weight** Infants born <2500 grams (5 lbs. 8oz.).

**Intra-uterine growth restriction** Refers to the poor growth of a baby while in the womb. Specifically, it refers to a foetus whose weight is below the 10th percentile for its gestational age.

**Sub-optimal breast feeding** When breast feeding falls short of the optimal practices: early initiation (within 1 hour of birth); exclusive breastfeeding for 0-6 months, then continuing breastfeeding to 2 years and beyond in conjunction with suitable complementary foods.

**Micronutrient malnutrition** is a term used to refer to diseases caused by a dietary deficiency of vitamins or minerals. More than 2 billion people in the world today may be affected by Micronutrient malnutrition. Vitamin A deficiency, iron deficiency anaemia and iodine deficiency disorders are the most common forms of Micronutrient malnutrition.

**Marasmus** is characterised by wasting of body tissues, particularly muscles and subcutaneous fat, and is usually a result of severe restrictions in energy intake. A child with marasmus is severely wasted and has the appearance of “skin and bones”.

**Kwashiorkor** is a form of severe undernutrition referred to alternatively as oedematous malnutrition. Symptoms may include bilateral pitting oedema; thin, sparse or discoloured hair; and skin with discoloured patches that may crack and peel.

**Severe acute malnutrition** is defined by a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional oedema.

**Moderate acute malnutrition** is defined by a low weight for height (below -2z scores of the median WHO growth standards),

**Macronutrients** are carbon-containing compounds (energy providing) of which the body requires large amounts and include proteins, carbohydrates and fats.

**Micronutrients** are substances needed by the body in small amounts for growth and prevention of infections, and include vitamins and minerals.

**Micronutrient Deficiency Diseases** result when the body is lacking in one or more specific vitamins or minerals.

**Exercise 4: Which part of the world is most affected by undernutrition?****What is the learning objective?**

- To be aware of the worldwide trends in undernutrition levels

**When should this exercise be done?**

- At the end of the session

**How long should the exercise take?**

- 30 minutes

**What materials are needed?**

- **Handout 4a:** Which part of the world is most affected by undernutrition?
- **Handout 4b:** Which part of the world is most affected by undernutrition?: Model answer

**What does the trainer need to prepare?**

- Handouts

**Instructions**

**Step 1:** Divide the group into pairs.

**Step 2:** Distribute Handout 4a.

**Step 3:** Ask pairs to discuss undernutrition rates in different regions in the world and to decide which region is most affected, with reasons (10 minutes).

**Step 4:** Feedback pair work in plenary for 10 minutes

**Step 5:** Distribute Handout 4b and ensure that everyone is clear about what the trends mean in terms of undernutrition in emergencies and non-emergencies. This should raise a debate about where most undernutrition is located and where most nutritional emergencies occur (10 minutes).

## Handout 4a: Which part of the world is most affected by undernutrition?

*Time for completion: 10 minutes*

*Working in pairs, decide in which part of the world under-fives are most affected by undernutrition and justify your answer using the correct terminology.*

In this session we have seen that undernutrition takes on many forms and has different definitions relating to its causes, its symptoms and its severity.

Table 1 shows the distribution of stunting and wasting among children (0-5 years old) in the world combining data from 2003-2008. The world has been divided into six regions. Data for the industrialized world (Western Europe and North America) is not included.

**Table 1: Estimated prevalence of children under five years, suffering from wasting and stunting in the world by region**

Percentage of under-fives (2003-2008 data)	Wasting (%)	Stunting (%)
Sub-Saharan Africa	10	42
Middle East and North Africa	10	32
South Asia	19	48
East Asia and Pacific	3	22
Latin America and the Caribbean	2	14
CEE <sup>1</sup>	4	16
Industrialized countries	No data available	No data available
<b>Average</b>	<b>13</b>	<b>34</b>

Source: UNICEF (2009), Tracking progress on child and maternal nutrition.

<sup>1</sup> Central Europe and Russia

**Handout 4b: Which part of the world is most affected by undernutrition? Model answer**

It is clear from the graphs that South Asia has the highest percentage of stunted (48 per cent) and wasted (19 per cent) children. This is followed by sub-Saharan Africa.<sup>2</sup>

Levels of stunting are much higher than levels of wasting.

Stunting is much more difficult to reverse than wasting and has longer-term consequences. However nutritional emergencies focus less on levels of stunting, instead they aim to reduce wasting levels which are associated with increased risk of mortality.

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<sup>2</sup> UNICEF, 'Tracking progress on child and maternal nutrition', 2009.



## 5. Case Studies

Case studies from the Philippines and the Occupied Palestinian Territory are presented in this section. Case studies are useful for getting participants to think through real-life scenarios. They also provide an opportunity for participants to work in a group and develop their analytical and decision-making skills. Trainers should develop their own case studies, which are contextually appropriate to the particular participant group. Ideally, trainers should use scenarios with which they are familiar. The FAO Nutrition Country Profile data exists for many countries.

### Exercise 5: Identifying those vulnerable to malnutrition

#### What is the learning objective?

- To give participants an overview of the size and distribution of the problem of malnutrition in their country or region

#### When should this exercise be done?

- As part of a longer in-depth training

#### How long should the exercise take?

- 60 minutes

#### What materials are needed?

- **Handout 5a:** Case study I: Size of the nutrition problem in the Philippines
- **Handout 5b:** Case study I: Size of the nutrition problem in the Philippines: Model answer
- **Handout 5c:** Case study II: Size of the nutrition problem in the Occupied Palestinian Territory
- **Handout 5d:** Case study II: Size of the nutrition problem in the Occupied Palestinian Territory: Model answer

#### What does the trainer need to prepare?

- Prepare a case study from a context familiar to the participants based on the template in Handouts 5a and 5c.

#### Instructions

**Step 1:** Give each participant a copy of Handout 5a or 5c. Point out that we use anthropometric measurements of children as a proxy measure/indicator for the nutritional status of the population and that they will find out how to do this in more detail in Module 6.

**Step 2:** Divide the participants into groups of (maximum) five people.

**Step 3:** Groups have 30 minutes to answer questions and prepare a three-minute presentation.

**Step 4:** Get the first group to feedback and subsequent groups to add to what has been presented. Allow for discussion in plenary and clear up any issues related to their local experience.

## Handout 5a: Case study I: Size of the nutrition problem in the Philippines

*Time for completion: 30 minutes*

*There are two questions to answer. Prepare a brief presentation of your discussion.*

Food is abundant in markets, and prices of food, including the basic staple rice, have not increased markedly since 1995. In fact, prices of rice have plummeted to record levels. Cases of drought-induced shortages in food supplies which were reported in the southern island of Mindanao in 1998 have all but disappeared. Robust harvests of rice and other food crops are expected in the main season crop, and all indications are of a further reduction in the cost of food. The upturn in food production has prodded government officials to stop further importation of strategic commodities such as rice. There are similar calls to stop the importation of poultry and livestock products. Food insecurity is considered to be primarily a chronic problem, except for in the conflict affected Mindanao where sporadic fighting and displacement affect household food security.

1. What do these tables tell us about the distribution of undernutrition in the Philippines?



## National Nutrition Survey data 1998

NNS <sup>3</sup> , 1998				Underweight % Weight for Age		Stunting % Height for Age		Wasting % Weight for Height		Overweight % Weight for Height
National	No.	Sex	Age (m)	<-3SD	<-2SD*	<-3SD	<-2SD	<-3SD	<-2SD	>+2SD
Llocos.	985	M/F	0-59		33.9		24.5...		6.5	
Cagayan	1,085	M/F	0-59		31.6		30.9		8.3	
CAR	1,419	M/F	0-59		27.0		39.3		4.0	
C. Luzon	1,664	M/F	0-59		26.6		21.4		6.4	
S. Tagalog	2,933	M/F	0-59		26.1		25.5		5.4	
NCR	2,928	M/F	0-59		26.0		24.3		6.5	
Bicol	1,500	M/F	0-59		36.3		34.3		5.1	
W. Visayas	1,877	M/F	0-59		39.0		35.1		10.4	
C. Visayas	1,729	M/F	0-59		33.0		38.0		3.7	
E. Visayas	1,377	M/F	0-59		38.8		40.4		6.1	
W. Mindanao	772	M/F	0-59		35.1		37.3		8.5	
N. Mindanao	1,097	M/F	0-59		31.0		36.1		4.7	
S. Mindanao	2,017	M/F	0-59		33.7		38.6		6.1	
C. Mindanao	1,107	M/F	0-59		32.6		38.4		6.3	
ARMM	879	M/F	0-59		30.2		36.9		9.2	
CARAGA	939	M/F	0-59		34.3		40.4		6.2	
FNRI UNICEF	10,668	M/F	0-59		33.9		34.3		6.7	0.4

Source: FAO nutrition country profile Philippines<sup>4</sup><sup>3</sup> National Nutrition Survey<sup>4</sup> <ftp://ftp.fao.org/ag/agn/nutrition/ncp/phlmap.pdf>

## 2. What do you notice about the distribution of micronutrient deficiencies?

NNS, 1998				Hemoglobin <sup>5</sup> % <11.0 g/dl	Vitamin A <sup>6</sup> % <10.0ug/dL
National	No.	Sex	Age (m)		
Llocos.	985	M/F	6-59	35.5	4.6
Cagayan	1,085	M/F	6-59	48.8	2.4
CAR	1,419	M/F	6-59	25.4	6.3
C. Luzon	1,664	M/F	6-59	30.5	6.8
S. Tagalog	2,933	M/F	6-59	20.7	6.8
NCR	2928	M/F	6-59	31.9	2.5
Bicol	1500	M/F	6-59	34.3	7.5
W. Visayas	1877	M/F	6-59	32.1	7.9
C. Visayas	1729	M/F	6-59	28.8	12.2
E. Visayas	1377	M/F	6-59	47.3	10.4
W. Mindanao	772	M/F	6-59	42.4	22.7
N. Mindanao	1097	M/F	6-59	19.8	8.7
S. Mindanao	2017	M/F	6-59	27.5	6.9
C. Mindanao	1107	M/F	6-59	33.8	9.4
ARMM	879	M/F	6-59	50.6	11.8
CARAGA	939	M/F	6-59	25.6	12.7

Source: FAO nutrition country profile Philippines<sup>7</sup>

<sup>5</sup> Indicates Iron deficiency anaemia

<sup>6</sup> Indicates vitamin A deficiency

<sup>7</sup> <ftp://ftp.fao.org/ag/agn/nutrition/ncp/phlmap.pdf>

**Handout 5b: Case study I: Size of the nutrition problem in the Philippines: Model answers****1. What do these graphs tell us about the distribution of undernutrition in the Philippines?**

East and West Visayas, Bicol and W Mindanao have high rates of underweight and although there are some similarities high rates of stunting also occur across the whole of Mindanao and Visayas regions as well as CAR, ARMM and Caragan. Wasting levels are not particularly high in most regions. West Visayas, West Mindanao are again amongst the highest rates for wasting and stunting.

Therefore, a concerted effort to understand the causes of malnutrition, and identify a response plan, should be focused here. Remind participants that stunting is related to long-term undernutrition when children fail to grow to their full potential (height and cognitive) due to chronically poor quality diets, and/or frequent or chronic illness, or regular acute episodes of both.

**2. What do you notice about the distribution of micronutrient deficiency?**

The distribution is similar to underweight and stunting. Micronutrient deficiency is mostly linked to poverty and possibly poor diet and/or malaria<sup>8</sup>

Discuss the situation of malnutrition in the Philippines in general (and in the provinces/regions, in particular, where the training and/or programme are being conducted/implemented).

Point out the links between undernutrition and poverty. Eventually poverty results in not having enough to eat or limiting dietary variety. Thus the manifestations of undernutrition are indicative of a problem further 'up the line'; food insecurity, care practices and sanitation in this case, as well as long term conflict and displacement for Mindanao.

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<sup>8</sup> A major cause of iron deficiency anaemia

## Handout 5c: Case study II: Size of the nutrition problem in the Occupied Palestinian Territory

**Time for completion: 30 minutes**

The humanitarian crisis in the occupied Palestinian territory (oPt) is a complex emergency caused primarily by persistent civil, political, and military conflict. A Food Security Survey was conducted by WFP and FAO from April to June 2009, based on a sample of 7,536 households in the Gaza Strip. It is estimated that nearly 1.6 million people are food insecure in the oPt, (38% of the population). An additional 12% are believed to be vulnerable to food insecurity. Food has been available, yet it is estimated that 61% of the population are food insecure due to lack of access. The Palestinian Medical Relief Society has found that up to 52% of Gaza's children are anaemic.

Living conditions for most Palestinians in Gaza have continued to deteriorate. The ongoing blockade has crippled the private sector, driving unprecedented numbers of Palestinians into unemployment and poverty. Global price increases for fuel and food commodities have had a severe impact on the population, due to the high dependency on imports.

The oPt produces less than 5% of its cereals and pulses, and prices of locally produced meat, poultry and vegetables have risen significantly. The severe limitations on imports of agricultural inputs, fuel and spare parts have devastated the agricultural sector. Previously self-reliant families are progressively falling into poverty and are unable to escape due to the absence of job opportunities. These predominantly lower-middle class or middle class households have been severely affected by the increased restrictions and economic restraints. Their resources have been slowly depleted and they now represent a group termed the 'new poor'.

Approximately one-third of Palestinians reported a decrease in income in 2008, with the poor having disproportionately suffered, with a 40% reduction in earnings. Negative coping strategies have been adopted, such as reducing the quality and quantity of food consumed. High costs have led to the exclusion of meat and fruits from the average diet.

1. What do these tables tell us about the distribution of undernutrition in the West Bank and Gaza Strip in the Occupied Palestinian Territory?
2. What do you notice about the distribution of micronutrient deficiencies?



## Nutritional status of children under 5 years of age, 2004-2008

	Underweight		Stunting		Wasting		Overweight	
	2004	2008	2004	2008	2004	2008	2004	2008
	<-2 Z scores	<-2 Z scores	<-2 Z scores	<-2 Z scores	<-2 Z scores	<-2 Z scores	<-2 Z scores	<-2 Z scores
<b>West Bank</b>	4.1		9.2	8	2.4	4	2.3	
<b>Gaza Strip</b>	5.4		10.3	17.5	3.0	13	2.3	

Source: FAO, <ftp://ftp.fao.org/es/esn/nutrition/ncp/pse.pdf> for 2004 data, and Field Exchange, issue 38, Thurstan, S., Sibson, V. Assessing the intervention on infant feeding in Gaza 2008, p 23-25 and Abu Hamad, Bassam., Johnson, E and ., Experiences and addressing malnutrition and anaemia in Gaza, 2008 p 26-29.

The table above details the latest available FAO data. More recent data<sup>9</sup> suggests that acute malnutrition rates amongst children under 5 have remained low, but have risen dramatically in the four years 2002 to 2008. The rate of chronic malnutrition has also risen sharply.

In addition, the high rate of low birth weight (7%) and an 'alert level' of micronutrient deficiency rates (iron deficiency anaemia >40%, vitamin A deficiency >20% in certain age groups, and a rickets prevalence of 4.1% in 6-36 month olds) have been identified.<sup>10</sup>

**Prevalence of sub-clinical vitamin A deficiency in children under 5 years<sup>11</sup> (defined as serum retinol < 20 µg/dL or 0.70 µmol/L)**

West Bank	18.9
West Bank North	21.9
West Bank Middle	13.8
West Bank South	19.4
Gaza Strip	26.5
Gaza Strip North	31.2
Gaza Strip South	21.5

<sup>9</sup> Abu Hamad, B., Johnson, E. (2008), Experiences and addressing malnutrition and anaemia in Gaza, in Field Exchange, issue 38, p 26-29.

<sup>10</sup> Thurstan, S., Sibson, V. (2008). Assessing the intervention on infant feeding in Gaza, in Field Exchange, issue 38.

<sup>11</sup> FAO, <ftp://ftp.fao.org/es/esn/nutrition/ncp/pse.pdf>

## Handout 5d: Case study II: Size of the nutrition problem in the Occupied Palestinian Territory: Model answers

### 1. What do these graphs tell us about the distribution of undernutrition in the Occupied Palestinian Territory?

West Bank and Gaza Strip do not appear to have noticeably high levels of malnutrition for any of the three indicators. Levels of underweight, stunting and wasting are marginally higher in Gaza Strip than in the West Bank, but this data may not be statistically significant (as we do not have access to confidence intervals, and therefore do not know the statistical significance of the data). However, wasting levels have increased in both areas between 2004 and 2008, as well as levels of stunting in the Gaza Strip. This is closely associated with levels of poverty since the second intifada in 2000, and underlying causes include reduced market access to fresh fruit, vegetables and protein sources. The diet has become more monotonous and there is an increased dependency on food aid. It is worth noting that levels of overweight are 2.3 % in both regions, and equal to the levels of wasting in West Bank, so this society is suffering from a double burden of malnutrition. In view of the protracted crisis situation it is important to look at micronutrient deficiencies.

### 2. What do you notice about the distribution of micronutrient deficiencies?

The distribution of vitamin A deficiency is similar to that of the anthropometric indicators. The regional differences for West Bank and Gaza Strip show that the northern part of each region have higher levels of vitamin A deficiency. This would need to be investigated further to try and attribute the cause of this; it could relate to cultural feeding preferences, availability of vitamin A rich foods and economic access to them. More information on iodine and iron deficiency would be useful. These micronutrient deficiencies have been attributed to poor dietary diversity (due to a reliance on food aid and a lack of purchasing power) and a decline in good infant feeding and breastfeeding practices. Considering the Middle Eastern diet is based on wheat and legumes and includes a high tea consumption pattern, maternal nutritional status data would be useful.



## 6. Field-based exercises

This section outlines ideas for exercises that can be carried out as part of a field visit. Field visits require a lot of preparation. An organization that is actively involved in programming or nutritional surveillance has to be identified to 'host' the visit. This could be a government agency, an international NGO or a United Nations agency. The agency needs to identify an area that can be easily and safely visited by participants. Permission has to be sought from all the relevant authorities and care taken not to disrupt or take time away from programming activities. Despite these caveats, field based learning is probably the best way of providing information that participants will remember.

### Exercise 6: Identifying different forms of malnutrition

#### What is the learning objective?

- To provide first-hand experience of seeing individual cases of malnutrition and its causes

#### When should this exercise be done?

- As part of an in-depth course and after the session on understanding malnutrition. Possibly after Module 4 as well

#### How long should the exercise take?

- 1 hour for the exercise plus travel (half day)
- 1 hour for the plenary feedback discussion at the end of the trip

#### What materials are needed?

- A digital camera for 4 to 5 people
- **Handout 6a:** Identifying different forms of malnutrition

#### What does the trainer need to prepare?

- The trainer will need to identify a suitable organisation and area for the field visit and organise all logistics (transport, fuel, meals etc.) for the visit. It is essential that the trainer visits the field site in advance of the visit in order to set up focus groups, identify key informants and identify potential problems. Discussion of the exercise should take place at the end of the visit either back in the classroom or in a suitable public place away from where the visit took place.

#### Instructions

**Step 1:** Divide participants into smaller groups. Give each group a camera.

**Step 2:** Take them to the nutrition centre or primary health care centre where severe cases of acute malnutrition are being screened for or treated and ask them to complete the handout.

**Step 3:** After an hour, groups return to the classroom for discussion of findings.

## Handout 6a: Identifying different forms of malnutrition

*Time for completion: 1 hour*

*You should be part of a group of four or five people with a digital camera. You will all go and visit a nutrition centre or a primary health care centre and interview one of the staff. Once you have finished you will share your findings in the classroom with the rest of your groups.*

### Part I – 1 hour

The aim of the field visit is to speak to a member of staff in the nutrition centre or primary health care centre in order to be able to answer the following questions. During the visit, you will hopefully be allowed to wander around and observe individual cases of malnutrition and take some photos. This will only be possible if it is done discreetly and professionally taking the individuals and their carers' concerns into consideration. In no way must the visit disrupt the normal activities going on.

**Questions to ask:** (Suggest students interview 5 children/caretakers to try to identify potential causes of malnutrition)

1. How is malnutrition classified by nutrition staff?
2. Are there cases of chronic and acute malnutrition here? How can they be differentiated?
3. How are different forms of moderate and severe malnutrition differentiated?
4. Are there any cases of severe acute malnutrition?
5. Are there any cases of severe acute malnutrition with bilateral pitting oedema?
6. Are there any cases of micronutrient deficiency disease, and how are they identified?
7. What clinical differences can you see between them?
8. Have you seen children that are overweight, or children that are undernourished with overweight caretakers? If so, could you give an explanation?
9. What can you say of the nutritional status of the carers?
10. Any other observations

### Part II

Once you have discussed your answers with the nutrition staff at the centre or primary health care clinic, write up your answers and take some photos to illustrate the different forms of malnutrition you have discovered during the visit. Be prepared to present the photos and your explanation as to the causes of malnutrition for that individual, to the rest of the group back in the classroom. The whole group will discuss the findings with help from the trainer.

# PART 4: TRAINING RESOURCE LIST

The training resource list is the fourth of four parts contained in this module. It provides a comprehensive list of reference material relevant to this module including guidelines, training courses and reference manuals. Part 4 provides background documents for trainers who are preparing training material.

### What can you expect to find here?

1. An inventory of existing **guidelines** and **evaluation reports** listed chronologically with details about their availability.
2. A list of known **training resources** listed chronologically with details about:
  - Overall content
  - Intended use
  - Target audience and length of time the course session has been designed for

### Guidelines, manuals and standards

1. **The Sphere Project (2011). Sphere Project Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response. Geneva: The Sphere Project.**

The new edition of the Sphere Handbook takes into account recent developments in humanitarian practice in water and sanitation, food, shelter and health and nutrition, together with feedback from practitioners in the field, research institutes and cross-cutting experts in protection, gender, children, older people, disabled people, HIV/AIDS and the environment. It is the product of an extensive collaborative effort that reflects the collective will and shared experience of the humanitarian community, and its determination to improve on current knowledge in humanitarian assistance programmes.

For field workers and decision makers in the humanitarian sector.

Availability: Printed and pdf form will be available online in English, French, Spanish and Arabic.

Contact: [www.sphereproject.org](http://www.sphereproject.org)
2. **United Nations Standing Committee on Nutrition (2010). Sixth report on the World Nutrition Situation: Progress in nutrition. Geneva ACC/ SCN**

Report outlining the world nutrition situation with details of trends and progress made by region.

Availability: Printed version in English

<http://www.unscn.org/files/Publications/RWNS6/html/index.html>
3. ....
4. **WHO (2009). WHO Growth Standards in Emergencies** and the identification of severe acute malnutrition in infants and children. **Factsheet, March 2009**

Available in English, French, Spanish, Arabic

<http://fex.enonline.net/36/factsheet.aspx>

## TRAINING RESOURCE LIST

5. **ENN, UCL-CIHD, ACF (2009). Management of acute malnutrition in infants (MAMI) project.**  
A retrospective review of the current field management of moderately and severely malnourished infants under six months of age.  
<http://www.ennonline.net/pool/files/ife/mami-report-contents.pdf>
6. **WHO/UNICEF (2009). WHO child growth standards and the identification of severe acute malnutrition in infants and children.**  
A Joint Statement by the World Health Organization and the United Nations Children's Fund.  
<http://www.who.int/nutrition/publications/severemalnutrition/9789241598163/en/index.html>
7. **IASC Global Nutrition Cluster (2008). A Toolkit for Addressing Nutrition in Emergency Situations.**  
[http://oneresponse.info/GlobalClusters/Nutrition/Documents/Global\\_Nutrition\\_Cluster\\_Nutrition\\_Emergencies\\_Toolkit\\_June\\_2008.pdf](http://oneresponse.info/GlobalClusters/Nutrition/Documents/Global_Nutrition_Cluster_Nutrition_Emergencies_Toolkit_June_2008.pdf) Available in English, French, Spanish, Arabic
8. **Lancet (2008). Lancet series on Maternal and child undernutrition.**  
<http://www.thelancet.com/series/maternal-and-child-undernutrition>  
Summary can be found at:  
<http://fex.ennonline.net/33/summary.aspx>
9. **Valid International (2006). CTC: Community based therapeutic care – A field manual**  
<http://www.ennonline.net/resources/553>
10. **ODI/Young and Jaspars (2006). The Meaning and Measurement of Malnutrition in Acute Emergencies, Network Paper No. 56. London: ODI.**  
Technical paper aimed at non-technical humanitarian actors, especially decision-makers, to understand, interpret and use nutritional data by looking at how it is collected, analysed and used. It also looks at how technical issues are linked to pragmatic institutional constraints. Of particular relevance:  
Chapter 1. Introduction  
Chapter 2. Basic concepts  
Chapter 3. The uses of data on acute malnutrition  
Chapter 4. Estimating malnutrition in emergency-affected populations  
Availability: Printed version and pdf file in English  
<http://www.odihpn.org/report.asp?id=2849>
11. ....
12. **WFP (2005). Food and Nutrition Handbook. Rome: WFP.**  
Manual to be used in WFP training course in Nutrition in Emergencies. Of particular relevance:  
Chapter 1. Basic nutrition concepts  
Chapter 2. Food groups and food aid commodities  
Chapter 4. Malnutrition  
Availability: Printed Version (English, French, Spanish); partial electronic version  
<http://foodquality.wfp.org/FoodNutritionalQuality/WFPNutritionPolicy/tabid/362/Default.aspx?PageContentID=537>
13. **UNICEF (annual), The state of the World's Children**  
[http://www.unicef.org/publications/files/SOWC\\_2011\\_Main\\_Report\\_EN\\_02242011.pdf](http://www.unicef.org/publications/files/SOWC_2011_Main_Report_EN_02242011.pdf)

## Research and papers

1. **Chastre, C, Levine, S. (2010). Nutrition and food security response analysis in emergency contexts,**  
[http://www.fao.org/fileadmin/templates/tc/tce/pdf/Response\\_Analysis\\_Framework\\_Discussion\\_Papers.pdf](http://www.fao.org/fileadmin/templates/tc/tce/pdf/Response_Analysis_Framework_Discussion_Papers.pdf)
2. **Black, R.E., Allen, L.H., Bhutta, Z.A., Caulfield, L.E., de Onis, M., Ezzati, M., Mathers, C., Rivera, J. (2008). Maternal and Child Undernutrition 1: global and regional exposures and health consequences.**  
The Lancet, Maternal and Child Undernutrition Series.  
[http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(07\)61690-0/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(07)61690-0/abstract)

## Policy and Strategy

1. **DFID (2010). The neglected crisis of undernutrition: DFID's Strategy.** Department for International Development.  
<http://www.parliament.uk/deposits/depositedpapers/2010/DEP2010-0651.pdf>
2. **ACF International (2010). Taking Action, Nutrition for Survival, Growth and Development.**  
White paper. ACF International  
[http://www.actionagainsthunger.org.uk/fileadmin/contribution/0\\_accueil/pdf/ACF%20International%20White%20Paper.pdf](http://www.actionagainsthunger.org.uk/fileadmin/contribution/0_accueil/pdf/ACF%20International%20White%20Paper.pdf)
3. **United Nations System Standing Committee on Nutrition (2010) Climate change and nutrition security,**  
16th United Nations Conference of the Parties (COP16) Cancun, November 29th – December 10th 2010.  
[http://www.unscn.org/files/Statements/Bdef\\_NutCC\\_2311\\_final.pdf](http://www.unscn.org/files/Statements/Bdef_NutCC_2311_final.pdf)
4. **Scaling Up Nutrition (SUN), (2010).**  
Scaling up nutrition: a framework for action.  
[http://www.unscn.org/files/Announcements/Scaling\\_Up\\_Nutrition-A\\_Framework\\_for\\_Action.pdf](http://www.unscn.org/files/Announcements/Scaling_Up_Nutrition-A_Framework_for_Action.pdf)
5. **Horton, S., Shekar, M., McDonald, C., Mahal, A., Krystene Brooks, J. (2009). Scaling Up Nutrition: What will it cost?**  
Washington DC. The World Bank.  
<http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/Peer-Reviewed-Publications/ScalingUpNutrition.pdf>
6. **UNICEF (2009). Tracking progress on Child and Maternal Nutrition**  
[http://www.unicef.pt/docs/Progress\\_on\\_Child\\_and\\_Maternal\\_Nutrition\\_EN\\_110309.pdf](http://www.unicef.pt/docs/Progress_on_Child_and_Maternal_Nutrition_EN_110309.pdf)
7. **Save the children, UK (2009). Hungry for Change, An eight step, costed plan of action to tackle global child hunger.**  
[http://www.savethechildren.org.uk/en/docs/Hungry\\_for\\_Change\\_EVERY\\_ONE\\_version\\_2nd.pdf](http://www.savethechildren.org.uk/en/docs/Hungry_for_Change_EVERY_ONE_version_2nd.pdf)
8. **High-Level Task Force on the Global Food security Crisis (2008). Comprehensive Framework for Action.**  
<http://www.un.org/issues/food/taskforce/Documentation/CFA%20Web.pdf>

## Donor Guidance

9. **European Commission, (Oct 2010) Communication from the Commission to the Council and the European Parliament, Humanitarian Food Assistance.**  
[http://ec.europa.eu/echo/files/policies/foodaid/HFA\\_Communication\\_220310.pdf](http://ec.europa.eu/echo/files/policies/foodaid/HFA_Communication_220310.pdf)
10. **USAID / OFDA guidelines for unsolicited proposals and reporting.**  
Oct 2008.  
[http://www.usaid.gov/our\\_work/humanitarian\\_assistance/disaster\\_assistance/resources/pdf/updated\\_guidelines\\_unsolicited\\_proposals\\_reporting.pdf](http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/resources/pdf/updated_guidelines_unsolicited_proposals_reporting.pdf)

## TRAINING RESOURCE LIST

**Training courses****11. FANTA-2 (2008) Training Guide for Community Based Management of Acute Malnutrition (CMAM).**

Available in English and French

<http://www.fantaproject.org/cmam/training.shtml>

**12. FAO (2007). FAO Food Security Information for Action Distance Learning Material – Food Security Information Systems and Networks; Reporting Food Security Information; Nutritional Status Assessment and Analysis. Rome: FAO.**

Distance learning materials designed for self-paced e-learning, developed by international experts to support capacity building, on-the-job training and workshops at national and local level, food security information systems and networks. Free of charge registration provides access to the materials. As of 31 July 2007, three separate courses are available.

Course: 1. Nutritional Status Assessment and Analysis (2.5 to 3 hours)

2. Nutritional Status and Food Security

3. Assessing Nutritional Status

[http://www.foodsec.org/dl/dlintro\\_en.asp](http://www.foodsec.org/dl/dlintro_en.asp)

**13. NutritionWorks and Feinstein International Famine Center, Tufts University (2007). Sphere Nutrition Training Module. NutritionWorks.**

Training modules available on the Internet. They aim to improve the technical capacity for humanitarian response in nutrition. They are aimed at staff with some responsibility for designing or monitoring nutrition related projects and aim to ensure an understanding of the scope and content of Standards in the Food Security, Nutrition and Food Aid chapter of the Sphere handbook, the key indicators, and the scientific/practical rationale behind these. The training modules include a lesson plan, handouts and visual materials. Relevant sessions include:

Session 1. Introduction to Nutrition Module

Session 2. Assessment and Analysis

<http://www.sphereproject.org/training/hnmodules>

**14. University of Westminster (2007). Nutrition in Emergencies: Short Course. London: Westminster University.**

A training course lasting one week and run by the Centre for Public Health Nutrition at the University of Westminster. Aims to give participants an over view of nutrition in emergencies.

<http://www.westminster.ac.uk/study/fees-and-funding/scholarships/other/short-course-nutrition-in-emergencies>

**15. University of Nairobi, FSAU, & FAO (2005). Training Package of Materials for the Course Food and Nutrition Surveillance and Emergency. Nairobi: University of Nairobi**

This training course provides an understanding of the nutritional outcomes of emergencies (malnutrition, mortality and morbidity) and also the causes of malnutrition and mortality in emergencies (the process and dynamics of an emergency). Of particular relevance:

Unit II. Session 7. Overview of malnutrition in emergencies

[http://www.unscn.org/en/resource\\_portal/index.php?types=9](http://www.unscn.org/en/resource_portal/index.php?types=9)

**Useful Websites:**

- [www.Fantaproject.org](http://www.Fantaproject.org)
- [www.validinternational.org](http://www.validinternational.org)
- <http://www.ennonline.net/fex/>
- [http://www.unscn.org/en/gnc\\_http/](http://www.unscn.org/en/gnc_http/)
- [www.nutrisurvey.net/ena-epiinfo](http://www.nutrisurvey.net/ena-epiinfo) (nut/mort)
- [www.smartmethodology.org](http://www.smartmethodology.org)
- [www.ipcinfo.org](http://www.ipcinfo.org)
- [www.unscn.org/en/scaling\\_up\\_nutrition\\_sun/sun\\_purpose.php](http://www.unscn.org/en/scaling_up_nutrition_sun/sun_purpose.php)
- [www.worldvision.org/content.nsf/learn/globalissues-disease-poverty](http://www.worldvision.org/content.nsf/learn/globalissues-disease-poverty)
- <http://www.fao.org>
- <http://www.ifpri.org/>
- <http://www.fews.net/>
- <http://www.oxfam.org.uk/>

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